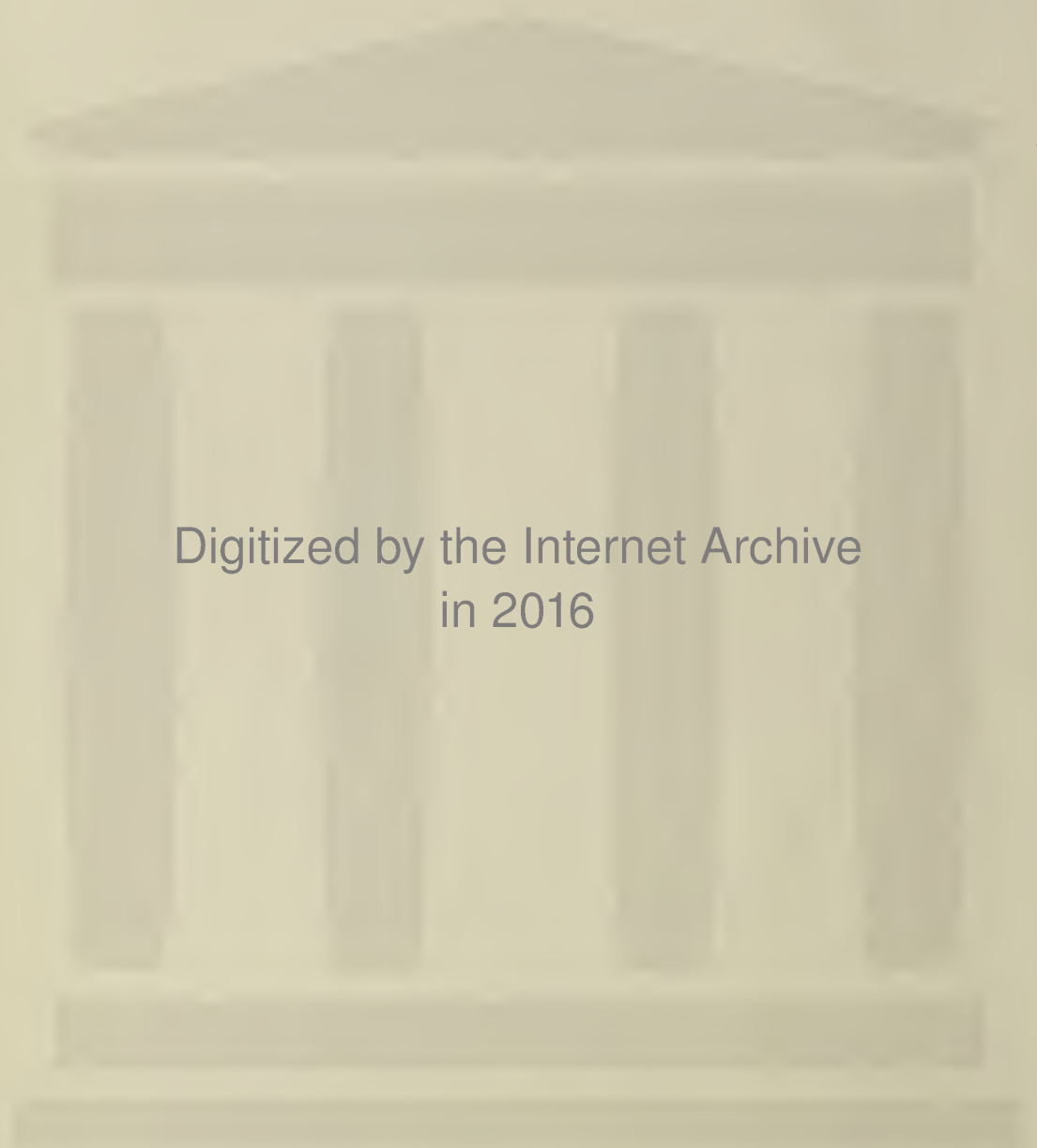
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Laboratory Evaluation

Reiter Protein Complement Fixation Test

In the Diagnosis of Syphilis

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*The Authors are indebted to H. G. Irvine, M.D., Consultant in Charge of Venereal Diseases, Division of Disease Prevention and Control, for his helpful suggestions in the preparation of this paper.

THERE is no single serologic test for syphilis which is sufficiently sensitive to detect every stage of the disease and which at the same time is specific only for syphilis. However, recent developments of serologic tests with antigens obtained from treponemes have increased, within certain limits, the specificity of the tests for syphilis. Protein antigen extracted from Reiter treponeme has received attention since D'Alessandro and Dardanoni[1] selected the Kolmer technique to demonstrate the serologic activity of this antigen. Cannefax and Garson,[2] using this antigen in a one-fifth volume Kolmer test, referred to the procedure as the Reiter protein complement fixation test (RPCF); this test is also referred to in the literature as the Kolmer Reiter protein or KRP test. It will be referred to here as the RPCF test.

During the past year and a half, the Division of Medical Laboratories has been conducting studies with the RPCF test in an attempt to determine the usefulness of this test in the diagnosis of syphilis. Our studies have indicated the RPCF test to be a useful serologic tool to aid in the diagnosis of syphilis. This was determined from laboratory tests and through clinical application of these tests in a cooperative study with Doctors Lynch and Binder.[3] Data are presented demonstrating the laboratory values and limitations of the RPCF test.

Beginning January 1, 1960 the RPCF test will be added to our "battery or special studies," and the Kahn test will be discontinued. The "battery or special studies" are usually performed on two vial specimens selected or requested by the consultant on the venereal disease program, Minnesota Department of Health.

Method and Materials

In our studies we used the Reiter protein antigen, Ryprogen,* in a one-fifth volume Kolmer test (RPCF). The details of this test can be found in the "Manual of Serologic Test for Syphilis."[4]

During our laboratory studies, 285 specimens were subjected to the RPCF test and to the Kline, VDRL, Kolmer, Kahn and Hinton test. The *Treponema pallidum* immobilization test (TPI) was obtained on a few specimens and the results will be presented. Of the 285 serum specimens 195 were from persons who were diagnosed as having syphilis and ninety were from persons in whom no diagnosis of syphilis had been established. The group of ninety specimens were submitted for serologic tests for syphilis either as a part of a routine check-up or part of a clinical work-up of an ill patient. The diagnosis of the clinically ill persons included illnesses or infections such as pneumonia, tuberculosis, infectious mononucleosis,

*Trade name of antigen, Organon, Inc., Orange, New Jersey.

TABLE I. COMPARISON OF V.D.R.L., KOLMER, AND R.P.C.F. TEST RESULTS
(195 Serum Specimens from Patients Diagnosed as Syphilitic and 90 Serum Specimens from Patients with No Diagnosis of Syphilis)

Test Result			Stage or Type of Syphilis												Total Diagnosed Groups		No Diagnosis of Syph.		Total All Groups	
			Primary or Secondary		Early Latent		Late Latent		Cardio-vascular		Neuro-syphilis		Con-genital							
VDRL	Kol.	RPCF	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
+	+	R	30	60.0	13	86.7	47	54.0	5	62.5	15	68.2	2	15.4	112	57.4	2	2.2	114	40.0
+	−	R	0	0	2	13.3	7	8.0	0	0	2	9.1	1	7.7	12	6.2	4	4.4	16	5.6
−	+	R	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.5	0	0	1	0.3
+	+	WR	3	6.0	0	0	8	9.2	2	25.0	1	4.5	1	7.7	15	7.7	3	3.3	18	6.3
+	−	WR	0	0	0	0	1	1.2	0	0	0	0	0	0	1	0.5	0	0	1	0.3
+	+	N	11	22.0	0	0	15	17.2	0	0	2	9.1	3	23.1	31	15.9	23	25.6	54	19.0
−	+	N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	7.8	7	2.5
+	−	N	2	4.0	0	0	7	8.0	1	12.5	1	4.5	6	46.1	17	8.7	22	24.5	39	13.7
−	−	N	4	8.0	0	0	1	1.2	0	0	1	4.5	0	0	6	3.1	29	32.2	35	12.3
Total			50	100.0	15	100.0	87	100.0	8	100.0	22	99.9	13	100.0	195	100.0	90	100.0	285	100.0

R.P.C.F. terminology:
R—Reactive=(1+, 2+, 3+, 4+)
WR—Weakly reactive=(±)
N—Nonreactive=(−)

V.D.R.L. and Kolmer terminology:
Positive=(+)
Doubtful or weakly positive=(±)
Negative=(−)

diabetes, lupus erythematosus, hepatitis, cancer of the uterus, and influenza. Only one of the ninety specimens was from a patient who gave a history of possible treatment for syphilis. There is no available record on this patient. The information pertaining to the 285 specimens was obtained from data cards accompanying the specimens, case reports or case records.

Test Results

For the purpose of comparing tests, the presentation in Table I is confined to the RPCF, VDRL, and Kolmer tests. Perhaps the outstanding feature in Table I is the demonstration that the RPCF test helps clarify the VDRL and Kolmer test results obtained with the ninety specimens listed under the heading "No Diagnosis of Syphilis." It will be noted that the RPCF test was nonreactive (N) in 52 (58 per cent) of the specimens where there was a combination of (VDRL +, Kolmer +) and (VDRL —, Kolmer +) or (VDRL +, Kolmer —). If the (VDRL —, Kolmer —) specimens are added to this group there are 29 (32 per cent) more non-reacting RPCF tests, making a total of 81 (90 per cent) specimens with "No Diagnosis of Syphilis" yielding a nonreactive RPCF test. It is significant that only 6 (6 per cent) of the specimens tested in this category were reactive with the RPCF test when both the VDRL and Kolmer tests were positive or the VDRL was positive and the Kolmer was negative. The combinations (VDRL +, Kolmer +) and (VDRL +, Kolmer —) or (VDRL —, Kolmer +) with a reactive RPCF test occurred in thirty (60 per cent) of the primary and secondary cases of syphilis, fifteen (100 per cent) of the early latent, fifty-five (63 per cent) of the late latent, five (62 per cent) of the cardiovascular, seventeen (77 per cent) neurosyphilis and only three (23 per cent) of the cases diagnosed as congenital syphilis.

In addition to the 285 specimens reported in Table I, serum specimens from 212 persons who had been vaccinated for smallpox were also examined in our laboratories by the tests described. F. W. Lynch and his associates[5] reported that only

TABLE II. RELATIVE SENSITIVITY OF THE V.D.R.L., KOLMER AND R.P.C.F. TESTS
(195 Serum Specimens from Patients Diagnosed as Syphilitic, by Stage of Syphilis and 90 Serum Specimens from Patients with No Diagnosis of Syphilis)

Test	Stage or Type of Syphilis												Total Diagnosed Groups		No Diagnosis of Syph.		Total All Groups	
	Primary or Secondary		Early Latent		Late Latent		Cardio-vascular		Neuro-syphilis		Con-genital							
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
V.D.R.L. Positive	46	92.0	15	100.0	85	97.7	8	100.0	21	95.6	13	100.0	188	96.4	54	60.0	242	84.9
Kolmer positive 2+, 3+, 4+	44	88.0	13	86.7	71	81.6	7	87.5	18	81.8	6	46.2	159	81.5	35	38.9	194	68.1
R.P.C.F. reactive 1+, 2+, 3+, 4+	30	60.0	15	100.0	55	63.2	5	62.5	17	77.3	3	23.1	125	64.1	6	6.7	131	46.0
Total specimens	50		15		87		8		22		13		195		90		285	

TABLE III. AGREEMENTS (COMBINED POSITIVE AND NEGATIVE) BETWEEN 195 PAIRS OF TESTS IN EACH STAGE OF SYPHILIS AND 90 PAIRS WITH NO DIAGNOSIS OF SYPHILIS

Test Combinations	Stage or Type of Syphilis												Total Diagnosed Groups		No Diagnosis of Syph.		Total All Groups	
	Primary or Secondary		Early Latent		Late Latent		Cardio-vascular		Neuro-syphilis		Con-genital							
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Kolmer-VDRL	48	96.0	13	86.7	71	81.6	7	87.5	19	86.4	6	46.2	164	84.1	57	63.3	221	77.5
RPCF-VDRL	34	68.0	15	100.0	55	63.2	5	62.5	18	81.8	3	23.1	130	66.7	42	46.7	172	60.4
RPCF-Kolmer	34	68.0	13	86.7	49	56.3	6	75.0	17	77.3	8	61.5	127	65.1	64	71.1	191	67.0
Total specimens	50		15		87		8		22		13		195		90		285	

one serum specimen showed a weakly reactive RPCF test and when the same specimen was re-tested it was non-reactive. On the other hand, fifty-seven serum specimens gave positive tests (reacted) when beef heart antigen was employed. These authors concluded that the fifty-seven specimens were "false reactions" and that the RPCF test has a higher degree of specificity in eliminating "false reactors" due to smallpox vaccine.

The data in Table I is oriented in Table II to show the relative sensitivity of these tests in each of the stages of syphilis and in the "No Diagnosis of Syphilis" group. The RPCF test has the lowest percentage of reactive results in all classifications except under the heading, "Early Latent," where one finds the VDRL and RPCF test equally sensitive.

Table III, which shows the percentage of agreements, demonstrates that the (RPCF, VDRL) and (RPCF, Kolmer) are generally much closer in agreement to one another than either is to the combination (Kolmer, VDRL). There are two distinct exceptions. Under the heading "Congenital" the pair (RPCF, Kolmer) and (Kolmer, VDRL) are in closer agreement than either is to the combination (RPCF, VDRL). This also holds true under the heading "No Diagnosis of Syphilis."

Table IV shows the agreements, partial agreements and disagreements obtained with the same serum specimen subjected to the TPI and RPCF tests. One of the two patients on whom there was a disagreement had a dignosis of late latent syphilis. The first blood specimen received from this patient was reactive in both the RPCF and TPI test; however, a blood specimen received later was non-reactive with the RPCF and reactive with the TPI test. The other of the two patients in the "disagreement column" remains undiagnosed; this person's blood serum was non-reactive in the RPCF and reactive with the TPI test.

TABLE IV. COMPARISON OF AGREEMENTS TPI AND RPCF TESTS WITH SAME SERUM SPECIMEN

Test Combination	Agreements		Partial Agreements		Dis-agreements		Total Patients
	No.	%	No.	%	No.	%	
RPCF-TPI	10	71.4	2	14.3	2	14.3	14

Illustrative Cases

In Table V the results of the serologic tests on a few selected individuals are given. The following brief history obtained from the case record of each individual is presented to demonstrate the relationship of the tests to the final diagnosis.

A. *Non-syphilitic:* She is a seventy-eight-year-old widow under treatment for chronic lymphatic leukemia. It is extremely unusual to see the VDRL positive in such high dilution in a non-syphilitic patient.

B. *Non-syphilitic:* Patient B shows contradictory results which are unlikely in syphilis but are quite characteristic of non-specific reactions. This forty-eight-year-old man is diabetic and was hospitalized at the time the Kolmer and Kahn tests gave a positive reaction.

C. *Primary Syphilis:* Patient C contracted syphilis from her husband (Patient D, a known case). Significant blood changes occurred in the thirty-six-day interval between the first and second specimens with all serologic tests becoming strongly positive except for the RPCF test which remained negative. Penicillin was given between the second and third specimens with the eventual reversion to negative reaction in almost all serologic tests performed.

D. *Primary or Secondary:* Patient D is the husband of case C. The darkfield examination done at the hospital was negative seven days prior to the first blood examination. The first blood was reactive in all tests including the RPCF test. Penicillin was administered between the first and second specimens, with subsequent change in all laboratory tests to a negative reaction.

E. *Secondary:* Patient E was named as a contact for Case F. He is twenty-one years of age, considered to have been infected for at least seven months prior to

TABLE V. ILLUSTRATIVE CASES

Patient	Lues	Days After First Specimen	R.P.C.F.	Results on Serological Tests for Syphilis				
				VDRL	Quant. VDRL	Kolmer	Kahn	Hinton
A	No	0	Nonreactive	Pos.	1-128	Pos. 4+	Pos. 2+	Neg.
		169	Nonreactive	Pos.	1-256	Pos. 4+	Pos. 4+	Neg.
B	No	0	Not done	Neg.		Pos. 4+		
		5	Nonreactive	Neg.		Pos. 4+	Pos. 4+	Neg.
		204	Nonreactive	Neg.		Neg.	Neg.	Neg.
C	Primary	0	Nonreactive	Neg.		Neg.	Neg.	Neg.
		36	Nonreactive	Pos.	1-32	Pos. 4+	Pos. 4+	Pos. 4+
		120	Nonreactive	Pos.	Undil. only	Pos. 3+	Neg.	Neg.
		193	Nonreactive	Pos.	Undil. only	Neg.		
D	Primary or secondary	0	R 2+	Pos.	1-16	Pos. 4+	Pos. 4+	Pos. 4+
		49	R 1+	Pos.	1-4	Pos. 4+	Pos. 3+	Pos. 2+
		140	Nonreactive	Wk. Pos.		Neg.	Neg.	Neg.
		160	Nonreactive	Neg.		Neg.	Neg.	Neg.
E	Secondary	0	R 4+	Pos.	1-8	Pos. 4+		
		15	R 3+	Pos.	1-8	Pos. 4+	Pos. 4+	Pos. 4+
		17	R 3+	Pos.	1-8	Pos. 4+	Pos. 4+	Pos. 4+
		20	R 3+	Pos.	1-8	Pos. 4+	Pos. 4+	Uns. due to lipoids
		95	R 4+	Pos.	Undil. only	Pos. 4+	Neg.	Dbt. ±
F	Early latent	0	R 4+	Pos.	1-16	Pos. 4+		
		26	R 4+	Pos.	1-16	Pos. 4+	Pos. 4+	Pos. 4+
		147	R 2+	Pos.	1-2	Pos. 4+		
G	Late latent	0	R 4+	Pos.	1-4	Pos. 4+	Pos. 4+	Pos. 4+
		194	R 4+	Pos.	1-8	Pos. 4+	Pos. 4+	Pos. 4+
		284	R 4+	Pos.	1-16	Pos. 4+	Pos. 4+	Pos. 4+
		384	R 2+	Pos.	1-8	Pos. 4+		
H	Late latent	0	R 2+	Pos.	Undil. only	Pos. 4+	Dbt. 1+	Pos. 3+
		122	Nonreactive	Pos.	Undil. only	Pos. 3+		
		284	Nonreactive	Pos.	1-2	Pos. 4+	Neg.	Insufficient
I	Cardiovascular	0	R 4+	Pos.	1-128	Pos. 4+		
		45	R 4+	Pos.	1-128	Pos. 4+	Pos. 4+	Pos. 4+
		191	R 4+	Pos.	1-64	Pos. 4+	Pos. 4+	Pos. 4+
J	Congenital	0	Nonreactive	Pos.	Undil. only	Neg.	Neg.	Pos. 2+
		155	Nonreactive	Pos.	Undil. only	Neg.	Neg.	Pos. 2+

collection of the first blood specimen. Treatment was started between the second and third specimens. There was no appreciable change in the RPCF test reactivity although the reagin tests Kahn, Hinton and VDRL tests demonstrated reduced reactivity at the end of a three-month period.

F. *Early Latent:* Patient F named Case E as a contact. There had been frequent exposures during the nine-month period previous to the collection of the first blood specimen. This young woman, aged nineteen was pregnant when first examined. She was treated with Duracillin intermuscularly and achromycin orally prior to the third specimen which was taken at the time of delivery.

G. *Late Latent:* Patient G was diagnosed in 1950. There is no treatment record available. In a period of eleven months there was no change in the serologic test results. The TPI test was reactive.

H. *Late Latent:* Patient H, a man aged forty-three, was treated after the first specimen was collected. After treatment the RPCF test became negative, the TPI test remained reactive and there was little change in the reagin test results.

I. *Cardiovascular Syphilis:* Patient I, a woman aged forty-five, was diagnosed and treated between the first and second specimen. The patient expired two days after collection of the last blood specimen.

J. *Congenital Asymptomatic:* Patient J is a forty-eight-year-old woman with three grown children in good health. The TPI test is weakly reactive.

Discussion

The basic difference between the RPCF test and the Kolmer test is principally the antigen and quantities of reagents used. Also, because the antigen in the RPCF is derived from a treponeme it is believed to be more specific than the Kline, VDRL, Kolmer, Kahn, and Hinton tests wherein one uses as an antigen either cardiolipin (beef heart) sensitized with lecithin and cholesterol or cardiolipin (beef heart) sensitized only with cholesterol.

The sensitivity of the various tests are dependent on the presence of the particular antibody which will react with the particular antigen used in the test and the differences of technique inherent in each test. D'Alessandro and his coworkers,[6] in their studies of the Reiter protein antigen state, "The antibody against treponema specific antigen of proteic nature are definitely demonstrable in every case of secondary and some cases of primary syphilis, even if reagin is lacking. Their presence is irregular in older infections and

treated cases. In some cases of late congenital syphilis treponemal antibodies are not demonstrable while reagin is still present in significant amounts." The results shown in Table II and particularly those under the heading "Congenital" conform to their statement. When one compares the per cent of positive reactions of each test for all syphilitic groups, it is noted that the VDRL is most sensitive and the RPCF is least sensitive of the three tests.

In a study conducted by Cannefax and Garson[2] they concluded that the RPCF test had a relative specificity of 98.86 per cent in comparison to the *Treponema pallidum* immobilization test (TPI). Accordingly, there should be very few occasions when the TPI test would be needed as an additional aid in the diagnosis of syphilis. The RPCF test, in addition to the Kolmer and VDRL tests, correlated with the clinical evidence and the patient's history will, in the great majority of instances, delineate the diagnosis of syphilis. Rarely should one find a biological false positive (BFP) reacting serum if the VDRL and Kolmer tests are positive and the RPCF test is reactive. However, should it be necessary to request a TPI test, certain criteria must be met before the specimen will be accepted by the U. S. Public Health Service Venereal Disease Research Laboratories. This laboratory performs the TPI test for the Minnesota Department of Health and other state health department laboratories. The patient must be a diagnostic problem with no history or clinical evidence of syphilis. All available serologic testing of serum (and, if possible, spinal fluid), should be completed and evaluated before requesting the TPI test.

A negative VDRL and Kolmer test combined with a non-reactive RPCF test is generally conclusive that the patient does not have syphilis, providing there is no clinical evidence or history of syphilis and that blood was not collected so early in the infection that there was insufficient time for antibodies to develop. In cases where blood specimens are collected too early in the infection, additional blood specimens should be submitted once or twice a month for about three months on all persons who had a suspected syphilitic chancre and whose serology tests were negative. Also, whenever there is a question regarding the diagnosis of syphilis, repeated laboratory studies should be made.

The RPCF will be performed only on "two-vial" specimens which have been requested by the Consultant on Venereal Diseases, Minnesota Department of Health, or where there is a question regarding biological false positive reactions. The RPCF test will be performed on Monday and Wednesday of each week. Accordingly, the reports of specimens subjected to RPCF test will be delayed for at least three days.

Summary

1. Effective January 1, 1960, the Reiter protein complement fixation test (RPCF) will be done on all "two vial" specimens, selected specimens or specimens requested by the Consultant on Venereal Diseases, Minnesota Department of Health, or where there is a question regarding biological false positive test for syphilis.

2. The Kahn test will be discontinued in the "battery testing" and will be replaced by the RPCF test.

3. The RPCF test will be performed on selected specimens twice weekly. Accordingly, there will be a delay of about three days in reporting the results on such specimens.

4. The RPCF test in combination with the Kolmer and VDRL correlated with clinical evidence and history should serve effectively in delineating the diagnosis of syphilis.

5. Requests for TPI test will be honored only after there have been repeated VDRL, Kolmer, and RPCF tests and there is clinical evidence to doubt that the results indicate syphilis. Arrangements for submission of specimens for TPI testing should be made before collecting blood.

References

1. D'Alessandro, G., and Dardanoni, L.: Isolation and purification of the protein antigen of the Reiter treponema. Am. J. Syph., Gonor., & Ven. Dis., 37:137-150, 1953.
2. Cannefax, G. R., and Garson, W.: Reiter protein complement fixation test for syphilis. Pub. Health Rep., 72:335-340 (April) 1957.
3. Lynch, F. W., and Binder, G. H.: Clinical evaluation of the Reiter protein complement fixation test in the diagnosis of syphilis. (To be published in Minnesota Medicine.)
4. Serologic Test for Syphilis. Manual. Washington. D. C.: U.S. Department of Health Education and Welfare, 1959.
5. Lynch, F. W., Kimball, A. C., and Kernan, P. D.: Serologic tests for syphilis following small-pox vaccination and including Reiter protein complement fixation technic. (In press, J. Investigative Dermatology.)
6. D'Alessandro, G., Oddo, F. G., and Dardanoni, L.: The antigens of the cultured *Treponema pallidum* (Reiter's strain) and the antispirochetal antibodies in human syphilis. J. Ven. Dis. Info., 31:314-15 (Dec.) 1950.

Reiter Protein Complement Fixation Test

In the Diagnosis of Syphilis

A Clinical Evaluation

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IT WAS the purpose of this study to review the clinical effectiveness of the Reiter Protein Complement Fixation Test (RPCF) as conducted in the serologic laboratory of the Minnesota Department of Health and it is the purpose of this paper to present to Minnesota physicians the results of the study and thereby to make them familiar with this additional procedure which is soon to be offered them in selected cases of serologic specimens submitted for aid in the diagnosis or exclusion of syphilis.

Among the most dependable of all clinical laboratory procedures have been the standard Serologic Tests for Syphilis (STS). It is generally accepted that they have a specificity rate of 99 per cent, when carried out in approved laboratories. Therefore, it may come as a surprise to many physicians that improvement is sought by serologists and syphilologists. To them the problem of reactivity to STS is particularly of grave concern when not given support by positive clinical history or physical findings, because of the possibility that the reaction represents a biologic false positive reaction (BFP) not due to syphilis. Known, but not generally appreciated by physicians, is the important fact that the standard STS are not fundamentally "specific" in their structure, utilizing as antigens proteins which are not derived from the causative organisms of syphilis or related organisms and whose sources are animal tissue unaffected by treponemal disease currently or in the past.

A valuable improvement in serologic testing for syphilis was achieved by Nelson in 1949 with the use of a specific antigen in the *Treponema pallida* Immobilization (TPI) test. The TPI test has since become highly regarded as an aid in distinguishing biologic false positives from positive reactions due to syphilis. Subsequently other tests which use antigens derived from *T. pallidum* have shared with the TPI test the disadvantages of high cost and limited availability until recently d'Allesandro and associates developed a less expensive test, the Reiter Protein Complement Fixation (RPCF) test, whose antigen is derived from the non-pathogenic Reiter strain of treponeme. This test has been evaluated in several extensive serologic surveys and has recently been used experimentally at the Minnesota Department of Health Laboratories. The results of this test were studied by the authors as applied to specimens submitted by Minnesota physicians in recent months.

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TABLE I-A. SEROLOGIC CORRELATION

Reaction	Patients Reported As Having Syphilis	Patients Presumed to be BFP Reactors		Serologic and Clinical Data Did Not Allow Exact Diagnosis	
		RPCF	TPI	RPCF	TPI
RPCF Reactive	68*	2	2 R	3	3 R
RPCF Weakly reactive	6	3	1 R 1 WR†	0	No TPI
RPCF Non-reactive	7	8	1 NR	40	4 NR 1 WR
RPCF Anti-complementary	2	3	2 NR	0	No TPI
RPCF Inconsistent	3	0	No TPI	1	1 R§

*Four patients had confirmatory reactive TPI tests.
†later NR
§later R

TABLE I-B. CLINICAL CORRELATION

Type of Syphilis	Reactive	WR	NR	Inconsistent	AC	Total
Primary	2	0	3	1	0	6
Secondary	5	0	0	1	0	6
Early Latent (E.L.)	5	1	0	0	0	6
Late Latent (L.L.)	32	6	10	1	4	53
Congenital	3	0	4	0	0	7
Ulcero Nodular	1	0	0	0	0	1
Neurological (C.N.S.)	11	0	3	1	0	15
Cardiovascular (C-V)	4	0	0	0	0	4
Clinically Negative	10	2	35	0	1	48
Total	73	9	55	4	5	146

Procedure

Serologic reports and clinical data for the 146 persons in Group I were made available to us largely from records collected by the Minnesota Department of Health since 1918.[1] These 146 persons consisted of: (a) eighty-six patients reported as having syphilis, the majority having been treated, (b) sixteen persons having reactive or weakly reactive standard serologic tests for syphilis but regarded as biologic false positive (BFP) reactors, (c) forty-four patients with reactive or weakly reactive STS but where the clinical evidence was insufficient to justify either the diagnosis or the exclusion of syphilis.

Additional clinical information, records of treatment, multiple STS and RPCF tests and results on spinal fluid examinations were obtained for as many of the patients as possible. The data were used for a more detailed classification of these patients without knowledge of the result of the RPCF (Tables IA and IB). For twenty Group I patients, TPI test results were available from the United States Public Health Service, Communicable Disease Center, Chamblee, Georgia.

Group II consisted of 212 university students undergoing physical examination on admission to school; it is thought that none previously or currently had syphilis. Blood specimens were collected from these students nineteen to fifty-two days following smallpox vaccination on the assumption, based on previous experience[2] and the report of others, that the vaccinia would produce biological false positive reactors useful for this study. Ninety-seven of the students had shown a primary reaction to vaccinia and 115 had shown an accelerated reaction; students showing an immune reaction were not tested. These specimens provided BFP reactions to STS from fifty-seven persons, thereby offering opportunity for a severe test of the RPCF technic on comparative studies.

The STS performed on the specimens from both groups of patients included three technics using cardiolipin cholesterol antigens (Standard Kahn, Hinton and Kolmer-Wassermann) and two

using cardiolipin - lecithin - cholesterol antigens (Kline and VDRL). These five tests and the RPCF test were performed as described in the accompanying paper which immediately precedes this report.

TABLE II. PRIMARY SYPHILIS

Case No.	Date	Before Treatment		After Treatment	
		STS	RPCF	STS	RPCF
17	1- 9	−	not done		
	1-21	−	NR		
	1-27	±	NR		
	4- 3			+	NR
50	6-17	±	not done		
	6-24	±	not done		
	9-13			±	not done
	12-18			±	NR
83	6-24	±	not done		
	12-18			±	NR
141	2-15	+	not done		
	2-22	+	R		
142	2-22	−	not done		
	3-23	±	R		
	3-31			+	R
163	2-20	±	not done		
	3- 4	+	R		
	7-21			±	NR

Results

Results of the tests (Table II) were reported as they will be given to Minnesota clinicians by the Minnesota Department of Health.[3]

1. *Reactive:* This is equivalent to 1+, 2+, 3+ or 4+, "positive" reactions on previously used STS.
2. *Weakly reactive:* This is the equivalent of previous reports of "doubtful."
3. *Non-reactive:* Equivalent to "negative."
4. *Anticomplementary:* As used with older serologic tests and as described in the immediately preceding paper in this journal. (Five sera reacted in this manner.)

RPCF Reactors.—On specimens from seventy-three of the 146 persons in Group I the RPCF test report was "reactive":

1. In sixty-three instances the STS and available clinical information made the diagnosis of syphilis practically certain. Four of these patients also had reactive TPI tests.

2. In five additional instances the STS were positive but there was no confirmatory clinical information. However, in three of these patients the impression of syphilis given by the RPCF test was confirmed by reactivity to the more highly specific TPCF and TPI tests.

3. The remaining five patients had doubtful or conflicting STS reports and no known clinical evidence of syphilis. In two of the five patients the impression of syphilis given by the RPCF test was confirmed by reactivity to the TPCF and TPI tests. In one there were no clinical data available and therefore there can be no judgment on the accuracy of the RPCF versus the STS. Two of the patients were elderly and presented serious systemic disease which may have produced BFP reactions to both types of test.

On the basis of the above results one judges that an RPCF report of "reactive" most likely signifies the presence of syphilis. The exact percentage of accuracy could not be measured in a survey such as this.

Weakly Reactive RPCF.—In this series most of the weakly positive reactions to the RPCF test became clearly reactive or non-reactive on retesting the same specimen of serum or another specimen submitted later.

Weakly positive reaction to the RPCF tests occurred in nine instances with no opportunity to examine another specimen. In two where the TPI was also used the results were confirmatory in one and uncertain in the other. In the remainder the STS report was doubtful in four and positive in three. In all but three of the patients a diagnosis of syphilis had been made and treatment given years previous to performance of the RPCF test. The weakly reactive RPCF report probably indicates the presence of syphilis unless the clinical data strongly suggest the possibility of a BFP result.

RPCF Non-Reactors.—On fifty-five patients the RPCF test report was "non-reactive."

1. In thirty-two instances the STS reports were doubtful and there was no other evidence of syphilis. (It is to be recalled at this point that under the conditions of this study Group I did *not* include patients with "negative" reports on STS.) In five of these the TPI test also was non-reactive; in one more it was reported only weakly reactive; in these six instances the RPCF test was probably correct. In one of the thirty-two, the results of the TPI and RPCF tests were not conclusive. Three of the thirty-two patients were pregnant; one had disseminated lupus erythematosus and one had diabetes mellitus; these five may have been BFP reactors to the STS, with the RPCF test correct.

2. In thirteen instances there were doubtful

STS reactions but the patients had had previous treatment for syphilis. In five of these, treatment had begun in the primary stage; four had been treated for congenital syphilis; three were elderly persons with syphilis of long duration and having received much treatment; and one was a young person having had very much treatment five years previously.

3. In four instances the STS reports were "positive" but unsupported by clinical evidence of syphilis. One had leukemia, one had arteriosclerotic heart disease and the third had severe hypertension, possible causes of BFP reactivity. One had been treated for syphilis though not reported as definitely diagnosed, having chronic lumbar osteomyelitis and having lived in the Sudan (BFP reactor?).

4. In six additional instances where the STS reports were "positive" three had much previous treatment for syphilis of long duration and three were elderly persons having had much treatment.

On the basis of the above results it seems that when the RPCF test is reported "non-reactive" this may indicate several possibilities:

1. If the STS report is "negative" then the presence of syphilis is unlikely. (Patients like this were not included in this study.)

2. If the STS is ± and (a) there is no other evidence of syphilis a BFP reaction to the STS is probable and likely; (b) if there has been previous treatment for syphilis the non-reactive RPCF report may indicate possible cure after effective treatment of early syphilis, congenital syphilis, or syphilis of long duration.

3. If the STS is + and there is no other evidence of syphilis a false positive STS reaction is probable. If treatment has been given previously, the non-reactivity of the RPCF may represent the result of treatment of syphilis of long duration.

Primary Syphilis.—Six patients were in the primary stage of syphilis. Analysis of their STS and RPCF results is given in Table II. The data show that the RPCF was reactive only when the STS was positive or doubtful, not when negative. This delay in development of RPCF reactivity has been commented upon by other authors. After treatment the RPCF may convert from reactive to non-reactive.

Among the patients who had early syphilis two to fifty-six years ago and who then had reasonably prompt therapy most remain RPCF reactive now (Table III.) In contrast most of them now have only doubtful STS reactions. Of three non-reactors to the RPCF, one still has a positive STS reaction.

TABLE III. CASES FOLLOWED SINCE PRIMARY STAGE OF SYPHILIS

Case Number	Type of Syphilis*	Duration of Disease (Years)	STS Results	RPCF Results
3	C-V	32	±	R
16	L.L.	12	±	NR
28	L.L.†	56	+	NR
31	C.N.S.	15	+	R
33	L.L.	33	±	R
35	C.N.S.	37	±	R
112	E.L.	2	+	R
113	L.L.	39	±	R
129	L.L.	31	±	R
149	C.N.S.	26	+	R
160	L.L.	7	±	NR

*Cardiovascular, late latent, neurological, early latent respectively.
†The diagnosis may be incorrect, and no record of treatment is available. The patient had acute encephalitis in 1935.

RPCF Anticomplementary Group.—There were five patients in whom only one serologic specimen was submitted and in whom the RPCF was reported anticomplementary (AC). Two of these patients had been treated for syphilis some years ago. The other three patients had no clinical history of syphilis, and two of them had non-reactive TPI tests. All five patients had doubtful STS. Because the anticomplementary report is of no help to the physician, further serologic studies are indicated.

RPCF Inconsistent Group.—The RPCF test was performed once on all patients included in this study. However, for twenty-two patients from whom further blood specimens were obtained, the test was performed on two, three or even four specimens. For eighteen of these patients the additional tests gave results that were consistent with the first one. In four patients RPCF tests performed on specimens submitted later in the study gave different results.

In one instance of primary syphilis, the RPCF was first reactive when the STS had become reactive. Four months following treatment the STS became doubtful and the RPCF non-reactive on two occasions.

In a patient with untreated secondary syphilis the RPCF changed from weakly reactive to non-reactive. Shortly after treatment the RPCF was

reactive. One wonders if the non-reactive reaction was due to technical error.

In another instance the clinical history was negative and the STS doubtful. RPCF was reactive

TABLE IV. CONGENITAL SYPHILIS

Case Number	Age—(Years)	STS Results	RPCF Results
8	40	±	NR
47	41	±	NR
65	20	±	NR
143	52	±	NR
34	47	+	R
72	20	+	R
102	27	+	R

as was TPI. Treatment was then given, and the RPCF was reported non-reactive ten weeks following therapy. Eight months later, TPI was still reactive and RPCF still non-reactive.

In an elderly patient having neurosyphilis treated adequately many years previously, the RPCF of February was reported weakly reactive and the test of October was reported reactive.

The RPCF may convert to non-reactive following prompt treatment of early syphilis. When the RPCF becomes reactive after being non-reactive or weakly reactive the clinical data and STS should be reviewed. Further serologic testing may be necessary.

Congenital Syphilis.—Seven adult patients having had congenital syphilis were included in this study; all had previous "adequate" antisyphilitic therapy. In four of these patients the STS were doubtful or conflicting and the RPCF non-reactive. In three patients the STS were positive and the RPCF were reactive. These serologic data indicate patients who are serologically "fast" or resistant, and the RPCF results are confirmatory in each instance (Table IV). It is possible that the non-reactive RPCF results were a better index of the response to treatment and a possible cure than were the ± STS.

BFP From Vaccinia.—Specimens from 212 university students collected following primary or accelerated reactions to vaccinia (Group II) served as a non-syphilitic control group and also presented a severe challenge to the RPCF test because vaccinia frequently stimulates BFP reactions to *non*-treponemal antigens. BFP reactions to the several STS for which non-treponemal antigen were used, varied from eight (4 per cent) reactions with the VDRL test to as many as forty-eight (23 per cent) reactions with the Hinton test. A total of fifty-seven persons (27 per cent) reacted falsely to one or more STS; none of these persons showed reactivity to the RPCF. There was weak reactivity to the RPCF test on one person with negative STS. A subsequent RPCF test on the same serum specimen was nonreactive. This lack of repeatability suggests two possibilities: that the reaction was due to technical error (likely) or that the reaction was due to a potentiality for vaccinia to produce BFP reactions to the RPCF test without simultaneous BFP to the STS (unlikely). Additional results and discussion on this group of tests were presented before the Society for Investigative Dermatology and will be published in the *Journal for Investigative Dermatology.*[4]

On the basis of this experience (at least with vaccinia) the RPCF test is less likely to react falsely than is the STS.

Comment

In most of the cases of reactivity to the RPCF test there was some confirmatory evidence of syphilis. In no case was there strong reason to doubt the presence of syphilis though one cannot be certain that there were no examples of false reactivity to the RPCF tests.

In cases where doubtful or conflicting reactivity to standard serologic tests is accompanied by non-reactivity to the RPCF there existed several possibilities: (1) The RPCF is falsely negative. (2) The STS is falsely positive. (3) In some instances decision may be impossible without long observation of the patient. When in the absence of previous treatment the STS is reported doubtful and the RPCF non-reactive the latter is most likely correct and should be depended upon unless the clinical history (personal or familial) gives evidence to the contrary.

After administration of antisyphilitic treatment: if the STS is more strongly positive than the RPCF, the latter may be a better indicator of satisfactory response to treatment; or if the RPCF is non-reactive a positive or doubtful STS report may represent false positive reactivity which lead to an incorrect diagnosis of syphilis at the time the treatment was instituted.

The Use of the Ileum in Urinary Diversion

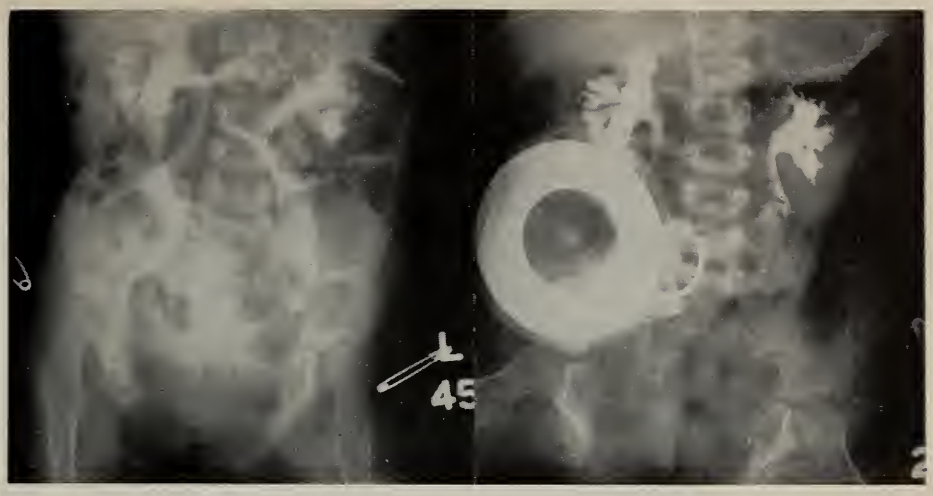


Fig. a. Fig. b.

Fig. 2. (a) Excretory urogram following ureterosigmoidostomy prior to ureteroileostomy. (b) Excretory urogram six weeks following ileal diversion. There has been a considerable reduction in hydronephrosis and hydroureter.

● *The use of terminal ileum as a conduit to divert urine from the ureters to the anterior abdominal wall has been applied in seventeen patients by these authors. There was no surgical mortality in this series. This operation could be useful and satisfactory in the majority of instances.*

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Presented at the Saint Paul Surgical Society, March 18, 1959.

THE FIRST ATTEMPT at diversion of the urine to the intestinal tract in the human being was made by Sir John Simon in the year 1851 on a patient with extrophy of the bladder.[1] Since that time, a number of operations have been devised. The methods for diversion of the urine to the intestine fall into three categories: (1) implantation of the ureter into the intact intestinal tract, (2) implantation into a completely excluded portion of the intestine, and (3) implantation into a partially excluded portion of the intestine. Until recently, ureterosigmoidostomy has been the most popular method. Dissatisfaction with this procedure due to the high incidence of hydronephrosis, pyelonephritis and electrolyte imbalance has led many to adopt ureteroileostomy as described by Bricker.[2] It is the purpose of this communication to outline our results with the latter procedure in seventeen patients.

Indications

The indications for surgery and the clinical data of interest in these patients is summarized in Table I. The procedures performed were: (1) cystectomy, panhysterectomy, iliac node dissection and diversion of urine to a segment of ileum in 5 patients, (2) cystectomy, prostatectomy, iliac node dissection and diversion of urine to a segment of ileum in three patients, (3) diversion of the urine to an isolated segment of ileum only, for palliation in two patients, for extrophy of the bladder in two patients, and for neurogenic dysfunction of the urinary bladder in five patients. The patients with neurogenic dysfunction had a primary diagnosis of either spina bifida or traumatic section of the spinal cord. In each instance, repeated attacks of pyelonephritis prompted ureteroileostomy.

TABLE I.

Patient	Age	Sex	Diagnosis	Date of Operation	Procedure	Comment
T.L.	58	F	Metastatic carcinoma of bladder from stomach.	9-16-55	Palliative ileal diversion.	Relief of bladder pain. Died 10-14-55.
C.U.	68	M	Carcinoma of bladder.	11-22-55	Total cystectomy node dissection. Ileal diversion.	Died of metastatic carcinoma 4-15-58.
I.L.	63	F	Carcinoma of bladder.	6- 8-56	Total cystectomy, panhysterectomy, excision vagina, vulva, urethra, iliac node dissection. Ileal diversion.	Right inguinal node dissection on 8-1-56—metastatic tumor. No evidence of recurrence—3-1-59.
L.T.	74	F	Carcinoma of bladder.	6-19-56	Palliative ileal diversion.	Died 9-15-56.
P.L.	11	F	Spina bifida urinary incontinence, pyelonephritis.	7-24-56	Ileal diversion.	Stricture of ileostomy with recurrence of pyelonephritis. Repaired 1-8-58. Well since.
M.R.	20	F	Spina bifida urinary incontinence, pyelonephritis.	1- 8-57	Ileal diversion. Removal of bladder stone.	Complete relief of bladder pain and attacks of pyelonephritis.
A.M.	40	M	Fracture spine, paraplegia, urinary incontinence, phelonephritis.	2-26-57	Ileal diversion.	Recurrent pyelonephritis since operation. Symtomatically improved.
C.K.	58	M	Carcinoma of bladder.	4-29-57	Total cystectomy, prostatectomy, iliac node dissection. Ileal diversion.	Alive and well.
S.G.	6	F	Extrophy of bladder, previous ureterosigmoidostomy.	9- 3-57	Ileal diversion.	Considerable improvement and weight gain.
L.E.	54	M	Carcinoma of bladder.	1- 9-58	Total cystectomy, prostatectomy, iliac node dissection, ileal diversion.	Postoperative ileus. Re-operated upon on 1-16-58. Has done well since.
B.M.	4	F	Spina bifida urinary incontinence, pyelonephritis.	4- 1-58	Ileal diversion.	Stricture of ileostomy.
E.A.	54	M	Carcinoma of bladder.	5- 5-58	Total cystectomy, iliac node dissection, ileal diversion.	Developed fecal fistula, renal stones, recurrent pyelonephritis, hyperchloremic acidosis without evidence of urinary obstruction.
K.L.	27	M	Extrophy of bladder, epispadias, pyelonephritis.	5-20-58	Repair epispadias. Excision of bladder. Ileal diversion.	Relief of symptoms.
A.M.	58	F	Carcinoma of bladder.	8-13-58	Total cystectomy, oophorectomy, iliac node dissection, excision vagina, urethra. Ileal diversion.	Alive and well.
A.N.	59	F	Carcinoma of bladder.	11-17-58	Total cystectomy, panhysterectomy, iliac node dissection. Ileal diversion.	Small retropubic abscess drained in postoperative period.
L.S.	29	M	Cervical fracture, quadraplegia, urinary incontinence, pyelonephritis.	1- 6-59	Ileal diversion.	Relief of pain, fever.
C.F.	56	M	Carcinoma of bladder.	2- 4-59	Total cystectomy, prostatectomy, iliac node dissection. Ileal diversion.	

Morbidity and Mortality

There have been three deaths, none related to creation of an ileal conduit for urine. The first patient in this series was operated upon in September, 1955, for metastatic carcinoma of the bladder from the stomach associated with hematuria and severe dysuria. Ileal diversion without resection was carried out with relief of symptoms and marked reduction in hydronephrosis. However, the patient died a month following surgery.

The second death occurred three months following palliative ileal diversion for primary carcinoma of the bladder. The third death resulted from metastatic carcinoma two and one-half years following total cystectomy, prostatectomy and iliac node dissection performed for primary carcinoma of the bladder.

Significant morbidity developed in six of the seventeen patients (Table II). Severe ileus which prompted re-exploration of the abdomen was encountered once. Stricture of the ileal stoma occurred twice in children and was the direct result of an ileostomy bag which was not cemented to the skin but held on loosely with straps. The stoma was revised in each instance without further difficulty. The case histories of the final two patients in Table II are summarized as follows:

TABLE II. MORBIDITY ENCOUNTERED FOLLOWING URETERO-ILEOSTOMY

Severe ileus	1
Stricture of ileal stoma	2
Retropubic abscess	1
Thrombophlebitis, fecal fistula, persistent urinary tract infection, renal stone formation, uremia and hyperchloremia	1
Persistent uremia with hyperchloremia	1

Case Histories

Case 1.—S. G., a six-year-old girl, was hospitalized July 30, 1957, with a pathological fracture of the left femur (Fig. 1a). There was no history of injury. Past history revealed that the patient was born with extrophy of the bladder, which was treated at age fourteen months by bilateral uretero-sigmoidostomy and excision of the bladder. Following this procedure the child was listless with a poor appetite and exhibited retarded physical development. She first began walking at the age of six at which time her weight was 26 pounds. Study revealed severe hyperchloremic acidosis (Table III), with generalized osteoporosis and roentgen changes of rickets (Fig. 1a).

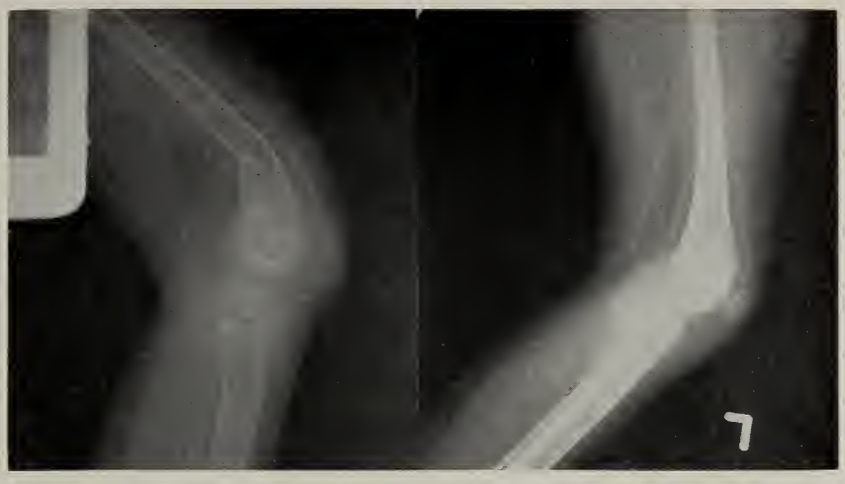


Fig. 1. (a) Roentgenogram of left femur, tibia and fibula of patient, S. G., aged six. Note the extensive demineralization and rachitic changes. The pathological fracture of the femur occurred when walking was first started at age six. The patient had undergone ureterosigmoidostomy at age fourteen months. (b) Three months after diversion of the urine to a segment of ileum. Note the marked improvement of bony structure.

Ileal diversion of the urine was performed on September 3, 1957, after intensive therapy with rectal irrigations and drainage and parenteral fluids had returned the blood chemistries towards normal. The patient improved considerably following surgery despite uremia and periodic acidosis. The child gained to forty-seven pounds by January, 1959, with marked improvement of bony structure (Fig. 1b). There has been a definite reduction in the hydronephrosis noted preoperatively (Figs. 2a and 2b).

Comment.—This patient developed the three major complications of uretero-sigmoidostomy, hydronephrosis, pyelonephritis with impaired renal function and severe hyperchloremic acidosis. While there has not been a complete recovery in renal function following uretero-ileostomy, marked improvement of hydronephrosis and electrolyte balance is evident.

Case 2.—E. A., a fifty-four-year-old man, developed frequency and dysuria in September, 1957. Cystoscopy January 9, 1958, by Dr. E. J. Richardson, revealed squamous cell carcinoma involving the vesicle neck and right wall of the bladder. Transurethral resection was carried out at that time but extensive recurrence was apparent on April 25, 1958, which involved the trigone and right ureteral orifice.

Total cystectomy with iliac node dissection and urinary diversion to an ileal segment was carried out on May 5, 1958. The pelvic floor was reperitonealized. The patient did well initially after surgery, but he was readmitted on June 6, 1958, for drainage of a small abscess in the retropubic space. Thrombophlebitis developed and fecal drainage from the region of the retropubic space was noted. The latter was due to rupture of a diverticulum of the colon for which a defunctionalizing colostomy was performed. A urinary tract infection with hyperchloremic acidosis developed at this time. In December, 1958, further study was prompted by the patient's complaint of back pain and the discovery of persitent urinary tract infection. Pyelograms revealed numerous renal stones. There was no evidence of obstruction in the genitourinary tract. Prior to this the patient drank up to 1 gallon of milk each day and took little other nourishment. The patient has improved recently on a regimen of Furadantin and Basaljel. The blood urea nitrogen has returned to normal on this regimen for the first time since operation.

Comment.—This patient developed a persistent urinary tract infection (Proteus and Pseudomonas) and renal stone formation without demonstrable urinary tract obstruction following uretero-ileostomy. Hyperchloremic acidosis has been an additional problem in this patient.

TABLE III. BLOOD AND SERUM ELECTROLYTES IN PATIENT S. G.

Date	B.U.N. mg%	CO_2 mEq/L	Cl mEq/L	Na mEq/L	K mEq/L	Ca mEq/L	P mEq/L
8-24-57	38	5	127			5.3	4.3
8-26-57				143	3.7		
9- 3-57	19	15	119	(Day of Operation)	(Day of Operation)		
9- 5-57	18	19	98		5.7		
9- 9-57	8	26	85	124	4.2	4.8	
10-13-57	29	19	112	143	5.0	5.2	6.3
3-13-58	36	11	105	140	3.9	5.2	5.5
1-23-59	27	15	112	142	4.1	5.1	5.4

TABLE IV. PERTINENT CHEMICAL DETERMINATIONS ON BLOOD AND SERUM IN SEVENTEEN PATIENTS REPORTED

Patient Number	BUN mgm%		CO_2 mEq/L		Cl mEq/L		Na mEq/L		K mEq/L	
	Pre-Op.	Post-Op.	Pre-Op.	Post-Op.	Pre-Op.	Post-Op.	Pre-Op.	Post-Op.	Pre-Op.	Post-Op.
1	13	—	—	—	—	—	—	—	—	—
2	16.6	20 11/34	—	29 24/30	—	106 100/110	—	139	—	4.2
3	25	20 19/28	—	26 26/33	—	104 99/117	—	143	—	4.6
4	27 23/25	15 15/20	—	27 21/27	—	103 103/109	—	—	—	—
5	19	19 18/24	—	28 22/29	—	105 104/106	—	—	—	—
6	17	20 14/24	—	24 24/30	—	103 94/103	—	—	—	—
7	8	15 8/16	22	25 15/26	106	103 101/110	—	140	—	4.8
8	—	18 18/20	—	26 26/28	—	108 108/109	—	146	—	5.0
9	19	20 8/36	15 14/19	20 8/22	113 113/119	112 85/116	143	142 124/145	3.7	4.0 3.9/5.7
10	16 14/21	15 8/25	23	21 16/23	105 105/108	110 108/114	—	140 138/148	—	4.7 4.7/5.2
11	—	20 20/26	—	20	—	107	—	—	—	—
12	11 11/30	15 15/16	23	20 18/27	106	109 109/112	—	—	—	—
13	13	18 16/54	—	17 12/28	—	109 92/118	—	134 132/145	—	3.5 2.0/3.4
14	18	—	29	29 28/34	109	103 90/109	146	140	5.5	4.8
15	—	14 14/16	—	23	—	105	—	142	—	3.8
16	8 8/14	14 11/42	23	26 25/26	109	112 102/113	144	140 140/146	4.7	4.0 3.5/4.4
17	12	18 18/28	20	15 13/22	109	109	—	140	—	4.7

Blood Chemistry

Preoperative and postoperative values for blood urea nitrogen, carbon dioxide combining power, serum chloride, sodium and potassium on all seventeen patients are summarized in Table IV. While serum chloride elevation above normal (105 mEq/L) is seen frequently, clinically significant hyperchloremic acidosis is unusual. Hyperchloremic acidosis is most likely to occur in patients with impaired renal function (Case 1).

Transient periods of hyperchloremic acidosis were noted in the patients who developed strictures of the ileum at the skin and in patients in whom catheters were used for drainage of the ileal segment. In the latter instance, the catheters were partially obstructed with mucus from the intestine. We have no evidence to support the concept[3] that hypokalemia is related to hyperchloremic acidosis encountered in these patients.

In Table IV, the range of chemistry values following operation is given with the most recent value preceding.

Pyelonephritis

Pyelonephritis has occurred following uretero-ileostomy in four of the seventeen patients. This was related to stricture of the ileal stoma in two patients and has not recurred since it was corrected. Many of the patients in this series had infected urine prior to uretero-ileostomy which has persisted since surgery. However, with the above exceptions these patients have been free of the clinical manifestations of pyelonephritis.

Pyelography

Pre- and postoperative pyelograms have been performed on sixteen of the seventeen patients. Those patients with obstructive uropathy prior to uretero-ileostomy are usually returned to normal or demonstrate only minimal hydronephrosis on intravenous pyelography.

In the absence of strictures at the ureteral anastomoses or at the ileal stoma the kidneys and ureters are likely to remain the same or to improve if mechanical obstruction preceded operation.

Discussion

The multiplicity of operative procedures that have been devised for diversion of the urine from the bladder is an indication that no one procedure is completely satisfactory. Possible advantages of the Bricker procedure[4] over many previously described are: (1) the ileal segment is isolated from the fecal stream which serves to decrease the incidence of pyelonephritis, (2) no sphincter exists to inhibit the flow of urine, (3) the ileal segment is a conduit rather than reservoir thereby decreasing absorption and back-pressure, (4) mucosa to mucosa and mucosa to skin anastomoses are made to decrease the incidence of stricture formation, and (5) a short ileal segment is used to decrease absorption.

While uretero-ileostomy has probably decreased the incidence of pyelonephritis, hydronephrosis and electrolyte imbalance, these complications have not been eliminated. Of equal concern is the fact that diversion of the urine to an isolated ileal segment has increased the incidence of other complications principally intestinal obstruction, and urinary fistula.[5] The latter complications have not occurred in the present small series.

Despite apparent inadequacies and without long term evaluation of the effects of implantation of the ureters into an isolated segment of ileum, this operation appears to be the best available method for urinary diversion at the present time. An improvement for the future could include decreasing the surface area of the ileal segment by removing the villi or lining the ileal segment with a less efficient absorptive surface. A recent report of experimental work by Martin, Duxbury and Leadbetter[6] would indicate that the latter is feasible. These workers were able to graft patches of urinary bladder epithelium to isolated segments of ileum being used as substitutes for the ureters in dogs.

Summary and Conclusions

1. The results have been documented in seventeen patients who underwent diversion of the urine to a segment of ileum as advocated by Bricker.[4]

2. The operation was performed for malignant disease in ten patients, for extrophy of the bladder in two patients and for neurogenic urinary bladder in five patients.

3. There have been no deaths directly attributable to the creation of an ileal conduit for urine. There have been three deaths due to carcinoma at one month, two and one-half months, and two and one-half years following the operation. The operation was least gratifying in the palliative treatment of carcinoma involving the bladder.

4. There has been a low morbidity related to the operation and in most instances the complications have been minor and easily resolved.

5. Pyelonephritis and severe hyperchloremic acidosis seen frequently after uretero-sigmoidostomy have not been eliminated by implantation of the ureters into an isolated segment of ileum but the incidence of these complications at a clinical level appears to be decreased.

(References are on Page 54)

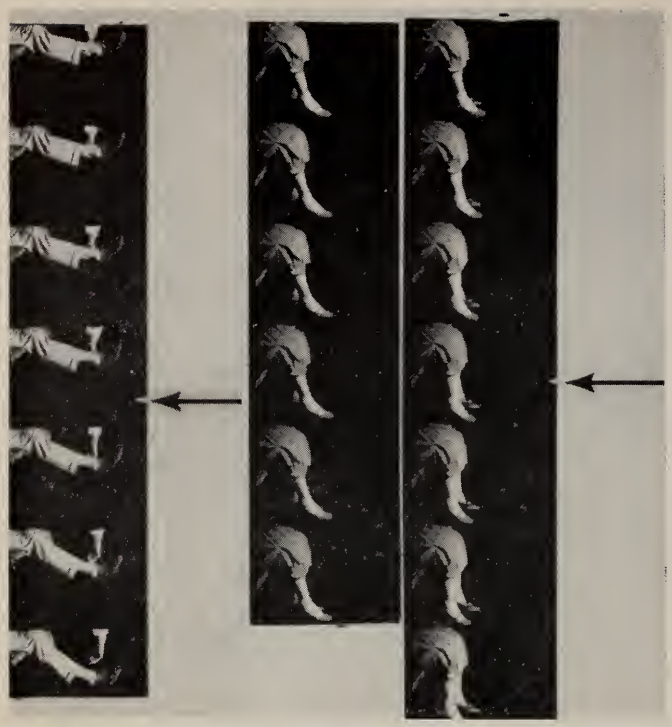


Fig. 1. (a) The leg begins to fall. Arrow indicates the first frame counted. (b) End of fall. The arrow indicates the last frame included in the count.

The Measurement of Spasticity

Description of a Method and Evaluation of a Drug: Trancopal

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SPASTICITY is a challenging problem in the treatment of many diseases involving the central nervous system. A large number of drugs have been tried and only partial success has been obtained with any of them. Neurosurgical procedures have been devised to interrupt pathways which might facilitate spasticity. So far neither medical nor surgical management has proved effective.

A new drug, Trancopal,® 2-(4-Chlorophenyl)-3-methyl-4-metathiazanone-1-dioxide, has shown promising results in animal experiments and also in clinical trials on patients with muscle spasms. The experiments in animals showed evidence of inhibition of "polysynaptic" reflexes. Therefore, it was our hope that it would prove beneficial in patients with spasticity. A preliminary clinical evaluation gave us the impression that the drug produced good to excellent results in four out of five patients with spasticity produced by multiple sclerosis.

The evaluation of spasticity solely by clinical means may have its merits and gives us a "clinical impression." The only data, however, which are amenable to accurate comparison are those which can be subjected to statistical analysis.

Electromyography has previously been used as an objective method for evaluation of spasticity.[1-3] It is generally accepted that electrical activity recorded from spastic muscle during voluntary motion or during reflex action is increased in duration and area of distribution as compared with that of normal muscles. However, exact measurements of EMG spike amplitudes are difficult and may be influenced by instrumental variables and limitations. Furthermore, there is a large subjective factor in measuring the amplitude of muscle spikes, and finally, variations of the stimulus applied to the muscle are difficult to avoid.

Several mechanical and electronic machines have been devised for quantitative measurements of spasticity and rigidity. Some measure the resistance exercised by a limb when it is passively moved[4,5] and others try to assess the resistance of a limb to the force of gravity.[6] Although these methods are ingenious and useful, they are too elaborate for routine use.

In view of the aforementioned factors, it was

considered necessary to look for a new simple method to measure spasticity which would be amenable to statistical analysis. In this paper such a method will be described as it was used in the evaluation of Trancopal.

Definition of Terms

Spasticity.—". . . . Increased resistance to manipulation, hyperactive deep reflexes, and clonus . . . constitute spasticity."[7] Clonus, as clinically measured, however, is not always present in association with spasticity and it is only apparent in the more severe cases. On the other hand, some degree of impairment of muscle power is always present in clinical cases of spasticity.

Stretch or Deep Tendon Reflex.—Stretch or deep tendon reflex may be defined as the reflex contraction of a muscle in response to a sudden stretch applied to it.

Muscle Power.—When we speak of muscle power in this paper, we are referring to the *voluntary* control of a muscle as it is manifested by both the active movement of a limb and its resistance to passive motion. It is important to remember that in spasticity there is increased resistance to passive motion. This, however, is not a voluntary opposition, but is the result of a reflex contraction of the muscle in response to stretch. Clinically it is almost impossible to distinguish between the resistance to passive motion produced by voluntary contraction and that produced by reflex contraction. We have to rely on what the patient tells us in cases where there is no voluntary contraction exerted. On the other hand, when the patient is told to oppose passive motion, it is not possible, even for him, to tell how much is produced by his will and how much is caused by reflex. A muscle which is ineffective in performing voluntary movements should be, therefore, graded in a low category even if resistance to passive motion is good. Isotonic contraction is, thus, more reliable than isometric contraction for the assessment of muscle power.

Material

Ten patients from the University of Minnesota Hospitals Multiple Sclerosis Clinic were selected for this study. The group consisted of six women and four men. All had been classified under the diagnosis of "multiple sclerosis" and all presented spasticity of the lower extremities, ranging in degree from mild in one patient to marked in eight, only one presenting a moderate degree. The youngest patient in the group was thirty-three years old and the oldest fifty-two. Duration of the illness ranged from six to twenty years. The disease had been characterized by remissions and exacerbations in eight patients and had been slowly progressive in two. Of the eight who had history of remissions and exacerbations, five had remained stable in their symptoms for at least two years, one for less than one year, one showed slight continuous progression, and one had come out of the hospital three months prior to the start of the experiment. This patient had an exacerbation followed by rapid partial remission and was stable when the tests started.



Fig. 2. Rebound occurring when the leg reaches the vertical position. Note that it does not swing beyond this position, differing in this from pendulousness of a relaxed extremity.



Fig. 3. Pendulous swinging of a relaxed extremity.

Five of the ten patients had been treated with muscle relaxants, including Zoxazolamine,® Mephenesin,® and quinine sometime during the course of their illness. Although some had reported temporary improvement with one or more of these drugs, no one had obtained a sustained effect from any of them.

These ten patients were selected for this study because they showed spasticity of the lower extremities, because their disease had a long duration and was fairly stationary and because, in spite of their disability, they were able to appear for weekly examinations at the clinic. For this reason, patients who lived in the city were selected.

Method

All patients were told that a new drug for spasticity was going to be tried on them for a period of two months following one month of weekly examinations without receiving the drug. The examiners knew there were two compounds, designated compound "A" and compound "B," one a placebo and the other Trancopal. Both compounds were identical in appearance, and the examiners were unaware which was Trancopal. The hospital pharmacy gave either compound according to prescription of the examiners who specified one of the two ("A" or "B") and the amount of it calculated for one month for each patient at each time.

Examinations were carried out weekly on the same day of the week and at the same hour of the day. The first month the patients did not receive any drug. This period was used to obtain a picture of fluctuations of spasticity in each patient without the pharmacological or psycholgical influence of a new drug.

In the second month, five of the patients received compound "A" and the other five received compound "B." The doses were given so that those patients taking the active drug would receive 100 mgm. of it four times per day. The patients believed they were all receiving the medication at this time. Examinations were continued in the same way at weekly intervals.

In the third month, the patients who had received compound "A" were given a new prescription, this time for compound "B." Patients who had been taking "B" were switched to "A." Examinations were continued at weekly intervals without change.

The weekly sessions included three parts for each patient. First, the patients were questioned as to how they felt in comparison with the previous week regarding their general condition and, in addition, specifically if there were any changes in spasticity and muscle strength. The second part consisted of a clinical evaluation of muscle strength in both quadriceps and patellar tendon reflexes bilaterally.

Muscle strength was graded as follows:

0 = Absence of any voluntary movement.
1 = Contraction of muscle detected by palpation but without effect on the limb.
2 = Voluntary movement present but not possible against gravity.
3 = Voluntary movement against gravity.
4 = Voluntary movement against mild resistance applied by the examiner.
5 = Voluntary movement against strong resistance and contraction maintained unchanged in spite of sustained opposition; normal muscle strength.

Minor changes between one state and the next were found, and therefore shorter steps were added by a — or + sign in front of each number, except numbers 1, which had no — and 5, which had no +. Thus, there was the possibility of 13 grades of muscle strength. However, + and — were not used frequently.

Patellar reflexes were graded as follows:

0 = Absent
1 = Hypoactive
2 = Normal
3 = Hyperactive
4 = Sustained patellar clonus

Intermediate grades were indicated by adding + or —. Unsustained clonus was signfied by 3+ or 4— according to its duration.

The third part of the examination consisted of the application of our method for measuring spasticity.

For this part, the patient sat at the edge of a high table with both legs hanging freely. The lower limb to be examined was then completely extended passively at the knee. The foot was sustained by the examiner and the patient was told to relax his muscle as much as possible. When the quadriceps was completely relaxed as assessed by palpation of the muscle, the examiner suddenly removed his hand from under the patient's foot and let it drop freely. The whole procedure was previously explained to the patients and they were told to let the leg fall without voluntary interference.

The procedure was filmed each time with a cinematographic camera at a constant film speed of 24 frames per second. It was performed twice for each leg at each examining session.

The number of film frames was counted between the first frame that showed any movement of the leg at the beginning of the drop, and the first frame that showed the leg swinging beyond

the vertical position (Fig. 1). In many cases there were several rebounds towards the horizontal, before the leg had reached the vertical position (Fig. 2). In those cases, the frames were added until the leg came to rest in the vertical position or until it swung beyond this position, indicating that the quadriceps was completely relaxed. These repetitive contractions of the muscle may be interpreted as equivalent to clonus and clearly have different significance from the pendulous swinging of a relaxed leg (Fig. 3).

At the end of the experimental period, the data were tabulated for each examination, still without knowledge as to which of the two compounds administered was the drug and which the placebo.

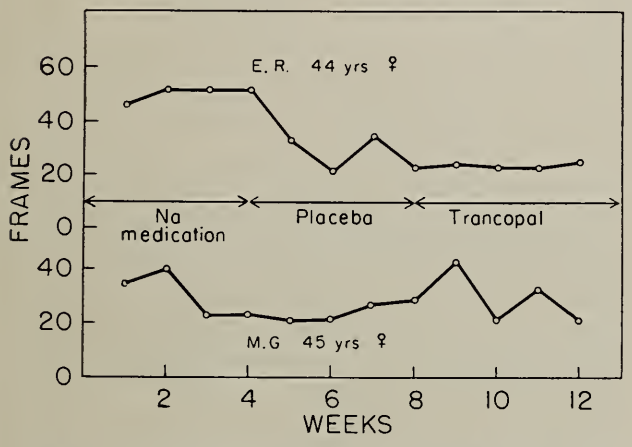


Fig. 4. Two types of curves in two patients who received placebo and Trancopal in the same sequence.

Results

When the numbers of film frames for each day of examination were put together in the form of graphs, very irregular curves were obtained (Figs. 4 and 5). On visual inspection, however, some curves seemed to show a descending trend.

For statistical analysis, we decided to use only the data obtained on the second trial of the right leg each week. It was felt that in this way, although the number of available data became more restricted, we would avoid artificially combining data for the two extremities or averaging the two trials for one given leg. The variations were quite large between the two legs and sometimes between two trials for one leg. This variability was remarkable even on patients whose disease process seemed fairly stationary.

Patients were divided into groups which we called "A first," and "A second," according to the period, second or third month, when they received compound A. Each group was subdivided into two columns of data, one column corresponding to the total number of frames of film obtained on the second trial with the right leg while the

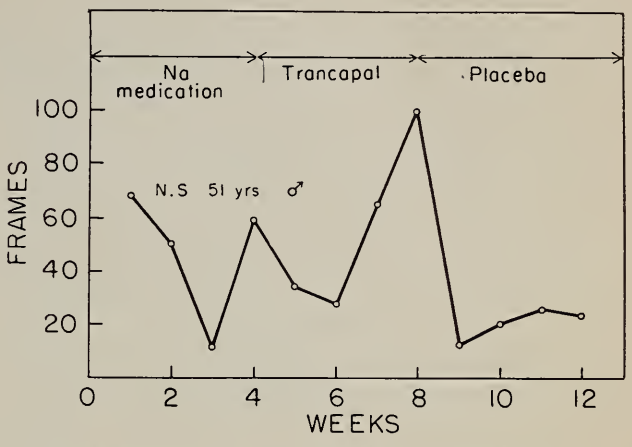


Fig. 5. A third type of curve in a patient who received the placebo and the drug in inverted order.

patient was on compound A, and the other to the number of frames while on compound B (Table I).

In order to find any significant difference between columns, we applied the formula:

$$t = \frac{\text{difference of means}}{\text{standard error of difference}}.$$

We first compared columns A and B of group "A first" and then columns A and B of group "A second." In this way, we looked not only for a significant difference between the columns which would depict different results between placebo and active drug, but also any difference that could be due to the sequence in which the two compounds were administered. We then compared column A of each group with the values obtained in the given group while the patients were not taking either compound ("O"). This should detect any significant changes produced by the psychological effect of a drug.

The results are shown in Table I. There was no significant difference between means in any of the instances investigated ($P = .1$). Thus there was no significant effect from the drug. We may say, on the other hand, that psychological factors did not influence the results with our method of testing spasticity in this group of patients.

From Table I, we may also say that there is no improvement with learning on the part of the

patients since there is no significant difference between the means of the three test priods.

In order to gather some statistical evidence which would make us feel more confident that what we are testing with our method is indeed spasticity as defined previously, we looked for correlation between reflex changes and number of frames, and also between muscle power and number of frames. If there is a direct relationship between degree of spasticity and number of frames of film, we should be able to predict that there should be a positive correlation between number of frames and degree of activity of deep tendon reflexes.

The correlation coefficient obtained from the total data on frames (second trial with right leg) and the total data on reflex activity on all the patients is r = .275. This indicates a positive correlation which is statistically significant (P = .01).

Six of our ten patients insisted on continuing the medication after the end of the experiment in spite of the fact that they were told that no significant effect on spasticity was obtained. They claimed that, in general, they felt better, slept better, and had less contraction spasms. This is possibly attributable to a "tranquilizing" effect which has been reported in connection with this drug.[8]

Correlation of degree of spasticity as measured by the method described in this paper, with deep tendon reflexes and muscle power, tends to corroborate the impression gained from theoretical considerations about the validity of the method.

In fact, we are measuring resistance to passive motion when the weight of the leg pulls on the quadriceps and at the same time we are measuring the response of the muscle to a sudden stretch. In this way, the two main properties of spasticity are involved.

The clinical methods for measuring strength and deep tendon reflexes may be crude and not as accurate as measurements by means of special devices. It is important, however, to restrict the number of our variables to one; the one that is being evaluated. The clinical examination of neurological functions has given us the values that we use in the daily definition of symptoms. Therefore, when we describe a new method, we should test it by its degree of correlation with the known and established values. If our method is valid, there should be a significant correlation. This correlation should not be too high, however, if the new method is more accurate than the old clinical techniques, as we assume it is. If the correlation is very high, we would have to conclude that the accuracy is of similar degree.

Decreased muscle power is said to be associated with spasticity. Therefore, we looked for a correlation between muscle power, as clinically measured and graded as previously described, and number of frames of film. The correlation coefficient is —0.384, which is statistically significant (P.= .01). There is, then, a significant negative correlation between spasticity, as measured by the method described in this paper, and muscle power, as clinically assessed.

Subjective evaluation of the drug by the patients did not present a consistent pattern. Some felt no improvement at all, some felt better while they were taking the placebo, some felt better while they

TABLE I.

	Patients	Number of Frames With Compound A	Number of Frames With Compound B	Number of Frames With No Compound ("O")
A first	E.R.	121	85	188
	N.R.	228	300	228
	M.G.	74	103	134
	M.F.	265	215	256
	E.B.	59	49	72
	Σx	747	752	878
		$t_{A,B}=\frac{\bar{d}}{SE\bar{d}}=0.01$ n=8	$t_{A,O}=\frac{\bar{d}}{SE\bar{d}}=0.41$ n=8	
A second	L.S.	85	120	94
	N.S.	52	124	171
	R.M.	120	99	135
	E.J.	33	42	51
	L.O.	78	55	59
	Σx	368	440	510
		$t_{A,B}=\frac{\bar{d}}{SE\bar{d}}=0.65$ n=8	$t_{A,O}=\frac{\bar{d}}{SE\bar{d}}=1.09$ n=8	

were taking the medication, and some felt better during the last two months of the experimental period while they were getting some "medication."

Side effects from the medication were completely absent except for slight somnolence in one patient. Urine analyses, blood counts, and liver function tests have been performed by us in patients on Trancopal four months or more and no abnormalities were found.

Discussion

From our data, we conclude that Trancopal did not produce significant effects on spasticity. This lack of response may be due to insufficient doses and not necessarily to aboslute lack of effect. Since we started the experiment, much higher doses have been given by other authors for varied conditions without any side effect.[8] We did not want to change the doses after we had started our testing period in order not to introduce new variables.

We found a positive correlation between the number of frames of film and activity of stretch reflex, and a negative correlation between the former and muscle power. Although some have the clinical impression that a spastic muscle is not weak and that when spasticity is overcome by some treatment the muscle becomes weak, this does not seem to be the case. According to our results, the more spastic a muscle is, the weaker it is. It is probable, however, that if we eliminate spasticity in a given case, even though muscle power may improve at the same time, it does not improve enough to give a normal function. With disappearance of spasticity, the hyperactive stretch reflexes will disappear and so will the increased resistance to passive motion. These two factors acting in the lower extremities in spastic patients, the first predominantly in antigravity muscles, make the limb *more effective functionally,* in a given *abnormal* condition. But this does not authorize us to say that the limb is stronger since the voluntary power is not increased but diminished in patients with spasticity.

Our method is based on the "pendulousness test" described by Wartenberg.[9] We have supplemented it by using cinematography for making it a quantitative method which is easily amenable to statistical analysis. Furthermore, we only use the first phase of the pendulousness test and observe only the fall of the limb to the vertical position. In fact, our measurement ends when pendulousness starts.

Recently Boczko and Mumenthaler[10] used photography to evaluate pendulousness and analyze changes in its duration and type. We believe that our method is more strictly quantitative and more accurate because it is less susceptible to influence of subjective factors. At the speed of film that we used, a large number of frames is exposed in most cases, and therefore small variations in counts which may occur between two different observers are of little relative significance. Cinematographic record of the passive motion of a limb is not only an accurate way for quantitative measurement of spasticity, it is also an appropriate method for frequent, short interval observation of the behavior of that limb as it goes through passive motion. This application should be useful in the study of pathophysiological mechanisms of spasticity.

Summary

A quantitative method for evaluation of spasticity is described. This measures by means of cinematography, the time of fall of the leg from the horizontal to the vertical position. The frames of film exposed during the time are counted and the changes in number subjected to statistical analysis.

The method was applied to the evaluation of a new drug, Trancopal, being used in patients with spasticity from multiple sclerosis.

Although there was no significant difference in effect on spasticity between a placebo and the drug under investigation, the majority of patients insisted in continuing taking Trancopal at the end of the experiment. In general, they felt better. This is attributed to the tranquilizing effect of this drug.

Positive correlation was found between spasticity as measured by this method and degree of hyperactivity of deep tendon reflexes. There was a negative correlation between the former and clinically measured muscle power.

The results are discussed.

Acknowledgment

We wish to express our appreciation to Dr. Eugene Johnson from the School of Public Health of the University of Minnesota for his cooperation in the statistical analysis. Also to Miss Sara Kugler for her technical assistance.

Winthrop laboratories supplied the Trancopal and the placebo tablets for this study.

(References are on Page 47)

Demerol as an Anesthetic Agent

SINCE THE use of intravenous Demerol® as an adjunct to anesthesia was first reported,[1] many investigators[2-7] have testified to its safety and efficacy in various surgical procedures. Such reports attest to ever increasing evidence that the traditional objections to the use of a narcotic in the operating room are unfounded. At the Asbury Methodist Hospital in Minneapolis, Demerol is routinely used as a primary anesthetic agent. Observations on 9,000 patients in whom the drug was so employed form the subject of the present report.

The cases included in this study were chosen consecutively from individuals undergoing major surgical procedures and selection was in no way limited by the type of operation, physical condition, age of the patient, or operative risk. Demerol was used in all cases for both induction and maintenance of general anesthesia. This project began in August, 1954 and is still in progress.

Methods and Results

A uniform method of induction was established for all adult patients: an initial dose of 100 mg. Demerol was administered intravenously followed by inhalation of a 2:1 mixture of nitrous oxide-oxygen. A combination of Pentothal® Flaxedil® was added until induction was complete. Demerol was then administered in increments of 20 mg. every four to ten minutes to maintain the desired surgical plane of anesthesia. Thereafter Pentothal, Seconal® or Flaxedil was added in small quantities when necessary. Intubation was performed when indicated and in these cases respiration was controlled for the remainder of the procedure. During or immediately following the closure, Demerol was discontinued and pure oxygen administered until the patient demonstrated an adequate respiratory pattern.

Children were treated similarly, with appropriate modifications in dosage as determined by age and weight.

The total dosage of Demerol varied considerably with the surgical procedure, the age and the weight of the patient. The smallest amount was given to a thirty-hour old infant during enucleation of one eye and iridectomy of the other for congenital bupthalmos and simple glaucoma, respectively. The largest dose was given during a sub-total gastrectomy performed on a forty-six-year-old negro male weighing 227 pounds. During this procedure, which lasted eight hours and twenty minutes, the patient received 2230 mg. of Demerol.

Table I shows the variation in dosage of Demerol in five typical surgical procedures.

Anesthesia was satisfactory and well maintained during all procedures, and complications during the postoperative period were found to be minimal. After discontinuation of Demerol, spontaneous respiration generally occurred within a

Demerol®, produced in the Winthrop Laboratories, is a brand of meperidine.

Used in 9,000 Surgical Cases

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short period of time and never exceeded twenty minutes. The longest period before a patient became totally reactive (responded to instruction) was three hours.

Respiratory and cardiovascular disturbances occurred infrequently and respiratory depression severe enough to warrant the use of Nalline® was seen in only four patients. When hypotension did occur during surgery it served as a guide to circulating blood volume and enabled corrective measures to be taken which reduced the incidence of postoperative shock. Vasopressor agents were required in only five patients whose conditions were complicated by coronary artery disease and who were thus felt to need vigorous treatment for even minimal signs of hypotension.

In open chest procedures, there was a surprising absence of cardiac irregularities and in other general surgical procedures not one pulse irregularity was noted. Two hundred patients were followed by cardioscopic examination which revealed no evidence of abnormality.

Discussion

The danger of respiratory depression has been the main contraindication to the use of Demerol in anesthesia. There are numerous reports, however, which indicate that disturbances in respiration need not be a hazard. In a survey of 800 cases in which Demerol was administered intravenously by continuous drip as a supplement to nitrous oxide-oxygen anesthesia,[8] a gradual slowing of the respiratory rate was observed, the respiratory center remaining functionally unchanged unless high doses of Demerol were administered rapidly. These conclusions are supported by an earlier report[9] in which respiratory and circulatory changes were avoided if Demerol was given slowly. If respiratory depression does occur, prompt recovery is the rule.[10-12] Our findings tend to support these previous investigations and when mild respiratory depression did occur, it was used to advantage and facilitated controlled respiration. In only four patients was depression serious enough to require an antidote.

TABLE I.

Procedure	Average Dose of Demerol	Maximum Dose of Demerol
Appendectomy	200 mg.	460 mg.
Cholecystectomy	285 mg.	1000 mg.
Gastric resection	420 mg.	2230 mg.
Lobectomy	360 mg.	1100 mg.
Craniotomy	400 mg.	840 mg.

Demerol combined with nitrous oxide anesthesia has been found safe and convenient even for children and elderly patients in poor physical condition. Auld noted that children were in better condition during the operation and withstood long procedures better.[13] In our series of patients both the youngest, a thirty-hour-old child, and the oldest, a 101-year-old woman, recovered uneventfully from anesthesia.

The advantages of Demerol in reducing the amount of barbiturates required during anesthesia and in shortening recovery time are well documented.[8,14-18] When barbiturates are used alone, they must be given in large doses to induce unconsciousness. The risk of respiratory depression is great and recovery time is prolonged thus increasing the number of possible postoperative respiratory and circulatory disturbances. In Widdowson's paper[16] it was noted that recovery time was shortened by more than one half when Demerol was added to a nitrous oxide-pentothal combination. This observation, lends support to the results we have observed in other patients. Recovery of a normal respiratory pattern varied from one to twenty minutes, and the maximum total recovery time was three hours. Supplementation and maintenance anesthesia with barbiturates was minimal and only occasionally necessary.

The second important reported objection to the use of Demerol as an anesthetic drug has been its effects on the cardiovascular system in inducing hypotension and cardiac arrythmias. As has been previously stated, these effects were found to be negligible in our experience with intravenous Demerol. Other observers have reported similar findings. Johnstone,[9] in a controlled study, administered Demerol intravenously to normal subjects and found EKG patterns to be essentially unaltered, while Ausherman, Nowill and Stephen[8] found blood pressure, pulse pressure and pulse rate to be unchanged in patients receiving Demerol as an anesthetic agent.

At the conclusion of this study, it was our opinion that Demerol, used as the primary anesthetic agent, had in good measure been responsible for the absence of even one instance of cardiac arrest, or death in the operating room or recovery section.

Summary and Conclusions

1. Intravenous Demerol combined with nitrous oxide-oxygen was used to induce and maintain general anesthesia in 9,000 major surgical procedures.

2. Observations are discussed with particular reference to the effect of Demerol on respiratory and cardiovascular systems. The lack of any untoward effect upon cardiac regularity was particularly gratifying and was considered to be highly significant in a series of this size.

3. A comparison of findings with those of other investigators indicates that this combination is effective and safe in general anesthesia.

References

1. Neff, William, Mayer, E. C., and de la Luz Peralez, M.: Nitrous oxide and oxygen anesthesia with curare relaxation. California Med., 66:67, 1947.
2. Herington G., and James, E. (Wanstead Hospital): Continuous succinylcholine chloride with pethidine in abdominal surgery. Brit. M.J., 2:317, 1953.
3. Rollason, W. N. (Hull A. & B. Groups, England): Anesthesia and the "bloodless" field. Anesth. & Analg., 32:289, 1953.
4. Langston, Kathleen W. (Shaughnessy Hospital, Vancouver): Controlled hypotension to reduce surgical hemorrhage. Canad. M. A. J., 69:371, 1953.
5. Ballantine, Robert I. W., and Jackson, Ian (St. Bartholomew's Hospital, London): Anesthesia for neurosurgical operations. Anaesthesia, 9:4, 1954.
6. Inglis, James M. (Birmingham Children's Hosp.): Anesthesia for cardiac catheterization in children. Anaesthesia, 9:25, 1954.
7. Lundy, J. S. (Mayo Clinic): Development of analgesia after a century of anesthesia. J.A.M.A., 157:1399, 1955.
8. Ausherman, H. M., Nowill, W. K., and Stephen, C. R.: Controlled analgesia with continuous drip meperidine. J.A.M.A., 160:175, 1956.
9. Johnstone, Michael: Pethidine and general anesthesia. Brit. M.J., 2:943, 1951.
10. Johnson, P. Dubar: Pethidine as an adjuvant to nitrous oxide and oxygen anesthesia. Brit. M.J., 2:705, 1951.
11. Pearce, Cecil: Intravenous pethidine in anaesthesia (Report on 330 cases). Brit. J. Anaesth., 23:205, 1951.
12. Ruben, Henning, and Andreassen, A. K.: Pharmacological effects of pethidine on the larynx seen during intubation. Brit. J. Anaesth., 23:33, 1951.
13. Auld, William: Pethidine, curare, nitrous oxide-oxygen anesthesia in children. Anaesthesia, 7:161, 1952.
14. Brotman, Milton, and Cullen, S. C.: Supplementation with Demerol during nitrous oxide anesthesia. Anesthesiology, 10:696, 1949.
15. Inglis, James McN.: Anesthesia for cardiac catheterization in children. Anaesthesia, 9:25, 1954.
16. Widdowson, H. R., Aquino, T. D., and Virtue, R. W.: Recovery time following Demerol or pentothal supplementation of nitrous oxide anesthesia. Anesthesiology, 16:747, 1958.
17. Stephen, O. R., and Pasquet, A.: Anesthesia for neurosurgical procedures: analysis of 1000 cases. Anesth. & Analg., 28:77, 1949.
18. Griffiths, H. F.: Pethidine as an adjunct to nitrous oxide and oxygen anesthesia. Brit. M.J., 2:763, 1950.

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The Effect of Promazine (Sparine) on Patients with Chronic Schizophrenia

TABLE I. PATIENT CHARACTERISTICS
(60 Patients)

Ward, Duration of Illness, Sex	Type of "Prior Therapy"	Total Number Patients	Number of Patients					
			Receiving "Prior Therapy"			Not Receiving "Prior Therapy"		
			Drug	Placebo		Drug	Placebo	
A. Ill 12-33 years Average 20.1 years Male	Lobotomy	6	2	3	5	0	1	1
	REST		0	0	0	2	4	6
	Insulin treatment		2	2	4	0	2	2
	"Conventional EST		0	0	0	2	4	6
	Drugs (ataractics)		2	3	5	0	1	1
B. Ill 3-24 years Average 15 years Female	Lobotomy	18	2	3	5	7	6	13
	REST		1	0	1	8	9	17
	Insulin Treatment		2	2	4	7	7	14
	"Conventional" EST		6	5	11	3	4	7
	Drugs (ataractics)		6	6	12	3	3	6
C. Ill 5-39 years Average 21.4 years Male	Lobotomy	23	2	2	4	10	9	19
	REST		3	2	5	9	9	18
	Insulin Treatment		7	5	12	6	5	11
	"Conventional" EST		6	5	11	6	6	12
	Drugs (ataractics)		6	3	9	10	4	14
D. Ill 9-29 years Average 19.7 years Male	Lobotomy	13	1	2	3	5	5	10
	REST		3	3	6	3	4	7
	Insulin Treatment		3	4	7	4	2	6
	"Conventional" EST		4	4	8	2	3	5
	Drugs (ataractics)		1	3	4	5	4	9

● *Many articles are published reporting on the advantages of certain new therapeutic agents. All too often the limitations of certain drugs are not well defined. This article points out limitations of a drug frequently used in certain types of patients. A small portion of their abundant statistical data is presented to support the authors' conclusions.*

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DURING the summer and autumn of 1956, we had the opportunity to carry out a small pilot study using promazine (Sparine*) in the treatment of patients with acute psychotic reactions admitted to a State Hospital. Like other phenothiazines, promazine appeared to be of value in the treatment of these acute psychotic reactions[1,2] and this together with favorable reports of its effect in chronic psychosis[3-6] encouraged us to try it in the treatment of more chronic schizophrenic patients. Aside from the impression of generally favorable effect, little information was gained from the uncontrolled pilot study. Rather large doses were used, twelve of the seventeen patients in the pilot study requiring doses of 1600 mg. a day or more. Five of these patients had grand mal seizures. Also, one patient in the pilot study developed a transient depression of the white count.[7,8] One patient in the pilot study experienced postural syncope when he reached a dose of 2400 mg. a day. Aside from these side effects typical of phenothiazines, no other toxicity or side

*Promazine Hydrochloride (and identically appearing placebo capsules) provided as Sparine by Wyeth Laboratories.

effects were apparent—such as photosensitivity, jaundice, or significant Parkinsonism.

The study reported herein (on the chronic group of patients) took place from April 1 to August 1, 1957, and involved sixty patients—thirty treated with the drug and thirty controls, with drug and placebo being administered in double blind fashion.

Method and Procedure

Description of Patients.—The sixty patients included in the study were selected from our chronic schizophrenic population on the basis of the chronicity and severity of their illness and the failure of response to prior therapies. (They were not broken down as to diagnostic sub-types in the schizophrenic category because it was not felt that this was of much value in such a chronic group.) Data was obtained on nine factors: ward, sex, age, duration of illness, and five prior therapies, namely, lobotomy, "conventional" electroshock treatment, insulin coma therapy, ataractic drugs, and "regressive" electroshock therapy (REST). Of these nine variables, four were experimentally controlled: ward, sex, prior lobotomy, and prior REST. The remaining five extraneous variables (age, duration of illness, and the other three prior therapies), were statistically controlled by randomized allocation of patients to the drug and placebo treatments. The information on these variables is summarized in Table I.

Of the five prior therapy variables, prior lobotomy and REST were controlled experimentally for the following reasons: (1) lobotomy and REST were considered the most drastic somatic therapies and, therefore, more likely to leave residual effects that might influence the subject's response to drug therapy more than the other prior therapy categories; (2) lobotomy, in particular, represents a concrete permanent change in all patients involved that makes them *a priori* different from non-lobotomized patients; (3) the group having had REST all received this treatment three to nine months prior to this study and, as they were part of an experimental REST study, thus had received a uniform, well-defined treatment schedule; we felt this isolated them as a more or less pure subgroup, similar in kind to the lobotomy group; (4) the patients who had received insulin coma, conventional EST, or prior drug therapy, had received such varied quantities of these modalities and at such varied times in the past (from months to many years), that it was felt they were not sufficiently defined in subgroups to warrant isolation for study.

Dosage.—As noted in the introduction, five of twelve patients in the pilot study, who were on a dosage of more than 1600 mg. a day, developed grand mal seizures. Therefore, we decided to hold the maximum dose to 1200 mg. a day. However, four patients developed grand mal seizures, two to seven days after dosage level of 800 mg. a day was reached during the second and third weeks of the experiment. These patients were then lowered to a total dose of 400 mg. a day, while the remainder of the experimental subjects remained on the 800-mg. dose level.

Evaluation of Psychiatric Effect.—The chief method of appraising the psychiatric effect of drug and placebo was through the use of the L-M Fergus Falls Behavior Rating Scale.[9] This measuring device (hereafter referred to as the "L-M" Scale), was used for the following reasons: (1) simplicity; (2) previously demonstrated reliability[9]; (3) validity for evaluation of chronically ill, regressed patients[10]; (4) reasonably comprehensive samples of behavior; (5) quantifiability of results. Ten of the fourteen items on the L-M Scale were considered relevant in evaluating these chronically ill patients. The scale is a very simple one as can be seen from the sample item which follows. Low numbers indicate inadequancy of performance, high numbers indicate more normal behavior.

H. Attention to dress and person

1.———has to be dressed—needs special attention of one kind or another.
2.———dresses self, but is sloppy.
3.———some interest in looks—too much lipstick, fairly neat.
4.———cares about looks and dress. Will ask for makeup or shaving equipment.
5.———normal attention to dress and person.

Although the designers of this scale have published reliability data,[9] we also collected reliability data from this study. The agreement between two raters on a given ward was acceptable.

Evaluation of Toxicity and Side Effects.—The presence of extrapyramidal signs, seizures, and

clinical hepatic toxicity was determined by clinical observation. Blood pressure changes were evaluated as follows: during the second week of the study, after maximal doses had been reached, the blood pressures were taken three times daily for three days, in both supine and (immediately thereafter) the erect posture. These measurements were carried out about one hour after each of the first three doses of the drug.

In addition to clinical observation on hepatic toxicity, that is, the presence or absence of jaundice, the subject's urine was tested for bile every three weeks throughout the study. The presence or absence of granulocytic depression in the blood was detected by measurements of the leukocyte count every three weeks during the study.

Since this was a double blind study, all measurements were done on placebo and drug subjects alike, while the nursing personnel, laboratory technician, and physician (acting as observer) did not know which patients were receiving promazine.

Results: Psychiatric Effect

L-M Scale Results.—Six L-M ratings were obtained for each patient, one initial or pre-study rating and five subsequent ratings spaced over the four-month study. Thus, for each patient, five different scores can be derived; that is, subsequent rating minus initial rating. These were then analyzed.[11] As stated in the last section, the L-M is constructed so that higher raw scores indicate more normal behavior; hence, positive difference scores are in the direction of improvement, and negative scores in the direction of more severe illness. For example, in Ward C, from Table II it is seen that the placebo group had a negative average difference score of minus 3.1, whereas the promazine group averaged a plus 1.0.

Since the study was carried out on four different wards, with four different sets of raters, we have an opportunity for four independent experiments discussed below.

TABLE II. RESPONSE TO PROMAZINE AND PLACEBO
(Ward C, 23 Patients)

"Prior Therapy" Group	Promazine	Placebo	Estimated Effect	Standard Error
Prior Lobotomy	— .3	1.0	—1.3	1.8
Prior REST	1.8	—2.6	4.4	1.8
Neither	1.3	—4.9	6.2	1.1
Weighted Average	1.0	—3.1	4.1	.82

TABLE III. CHANGE IN RESPONSE TO PROMAZINE AND PLACEBO OVER PERIODS OF TIME
(Ward C, 23 Patients)

	Time Periods									
	I		II		III		IV		V	
Prior Therapy	Drug	Placebo	Drug	Placebo	Drug	Placebo	Drug	Placebo	Drug	Placebo
Prior Lobotomy	—4.5	2.5	—2.0	2.0	1.0	1.0	2.0	0	2.0	—0.50
Prior REST	1.5	—3.5	4.5	—8.5	3.0	0.5	2.0	—2.0	—2.0	+0.50
Neither	1.8	—6.0	0.6	—5.2	1.0	—4.2	2.6	—3.8	+0.32	—5.20

Ward C.—From Table II, it is seen that the over-all difference in effect of promazine and placebo averages 4.1. This effect is statistically significant (standard error, 0.82).

In addition to the over-all effect of the drug, there is a significant difference between the various "prior therapy" groups and their response to drug and placebo as illustrated by Table II. From this table we see that the presumed beneficial effect of promazine is most noticeable with the ten patients in the "neither" group (neither REST nor lobotomy) (average difference 6.2). The difference in the "prior REST" group is not so striking (mean difference 4.4), but here the placebo subgroup did not deteriorate as much as the "neither" placebo group.

Some light on the question of how the drug effects vary with time is available from Table III. Considering first the "neither" group, we see that the drug and placebo group maintain a fairly constant difference throughout each period, thus reflecting the over-all difference. In the case of the "REST" group, however, the favorable difference noted initially between drug and placebo are reversed at the last period (this is not enough to affect the over-all favorable difference previously mentioned). The results of the "lobotomy"

group, are quite interesting. Here, the drug group is initially quite inferior to the placebo group, but there is a consistent drift in opposite directions for the drug and placebo group, so that the trend is consistently favorable for the drug group (as previously noted, this favorable trend was not of sufficient magnitude to give an over-all favorable difference for the lobotomy group).

At this point we should pause for a bit of interpretation since the foregoing description of the L-M Scale findings on Ward C represent the only statistically significant psychiatric findings from this study. What do these results mean? Perhaps the most striking observation is that (particularly for the "neither" group) a large part of the observed differences were contributed by the deterioration of the placebo group from its initial level, and only a minor part of the difference was due to improvement in the promazine group. We do know that some of the patients from both drug and placebo group were on ataractic (especially chlorpromazine) drug therapy of variable dose and duration prior to the initial L-M. Since all such drugs were discontinued after the initial L-M and before the Period I measurement, we can speculate that the deterioration of the placebo group may have been related to this loss of prior drug therapy in a substantial number of the patients. The promazine was barely able to maintain L-M performance throughout the study, despite the fact that many of the patients had not been on prior drug therapy.

Wards A, B and D.—The L-M data for these wards was analyzed and charted in a similar fashion. The effect of the drug was not statistically significant in any case.

Results: Toxicity and Side Effects

Extrapyramidal and Related Toxicity.—The majority of phenothiazines so far used clinically are capable of causing extrapyramidal symptoms such as muscle rigidity, tremor, masked facies, and excess salivation. In our pilot study, we noted minimal signs of Parkinsonism even with doses of promazine in excess of 1600 mg. a day. In the experimental drug group, no unusual muscle rigidity or tremor developed. However, four patients receiving the drug (none in the placebo group) developed severe continuous excess salivation with drooling. One of these patients had also had a seizure and was only on 400 mg. per day; the others were on 800 mg. per day. Two of the four developed ulcerative stomatitis and the drug had to be discontinued, in one case during the fourth week, and in the other in the ninth week of therapy. White blood counts were elevated at the time of the stomatitis. All four of these patients were extremely regressed men—mute, negativistic, withdrawn, "immobile" in character, with severe habit deterioration.

Masked facies, as observed in classical Parkinsonism, could not be defined. However, many patients were noted to have ptosis of the eyelids. This was mild, symmetric, and inconstant. The subjects with ptosis were identified and recorded in the third week of the study, and again in the fourteenth week. Both sets of observations were done in the early evening after the patients had received three of the four doses of drug or placebo for that day, and the second set of observations in the fourteenth week was done without reference to the first set. Upon completion of the study, this information was analyzed[12] to see how accurate the observer was in identifying the drug patients on the basis of the presence of ptosis. It was concluded that the observer did a better job in identifying patients on thed rug early in the study than he did later, perhaps because ptosis lessens as tolerance occurs.

Hepatic Toxicity.—Since jaundice of intrahepatic obstructive type has been observed with Chlorpromazine, we incorporated a screening test for urine bile in our study of promazine. Our laboratory used Smith's test for bile pigments.[13] About five out of eight patients receiving the drug were found to have bile in the urine (62 per cent, standard error 5 per cent). All of the control subjects gave negative results.

Similar positive reactions for bile in the urine have been reported for patients on Chlorpromazine and considered to be unrelated to hepatic dysfunction.[14] If this test could be refined so that it could be used as a simple semi-quantitative estimate urinary phenothiazine content, it would have practical value in a state hospital setting.

Hematopoietic Toxicity.—No clinically detectable effect on leukocytes was noted. One leukocyte count below 5,000 was obtained, but this was on a control patient. The more than 400 determina-

tions (seven for each patient) were analyzed by the same statistical methods used in analyzing the L-M Scale results. No statistically significant trends were noted indicating any difference between drug and placebo groups. This is not surprising in view of the small number of patients receiving drugs, and particularly the small number of female patients who are reported to be more susceptible than males to phenothiazine induced agranulocytosis.[7]

Grand Mal Seizures.—No patients known to have seizures were included in the study at the outset. Phenothiazines have been known to increase susceptibility to grand mal seizures, and studies correlating electroencephalographic changes with drug therapy have been done in patients receiving Chlorpromazine.[1,4,15,16] In fact, Chlorpromazine has been suggested as a means of "activating" the brain wave in patients suspected of cerebral dysrhythmias.[17]

Four of our thirty drug patients developed grand mal seizures, whereas none of the group receiving the placebo had seizures. All the seizures occurred in drug patients on Ward B and C. We first examined the data from the point of view of the occurrence of seizures while on promazine in relation to prior lobotomy because it is known that prior lobotomy at times renders the patients susceptible to grand mal seizures. In neither ward was a statistically significant relation found between the occurrence of seizures and prior lobotomy in the drug group.[18]

The data on Wards B and C were also analyzed for over-all statistical association of seizures occurring in the drug group. Although seizures occurred among those receiving the drug and not those receiving the placebo, the occurrence is within conventional chance levels for the stipulated dosage of 800 mg. per day.

Nevertheless, in view of the suggestive findings from the pilot study and reports in the literature, it appears that promazine hydrochloride therapy may be related to the occurrence of grand mal seizures. This appears particularly likely in view of the fact that none of the patients in either drug or placebo group have had further seizures up to the time of this report.

Postural Hypotension.—As described previously, nine pairs of blood pressure determinations (obtained supine and erect) were available for analysis. We were able to carry this program out on Wards A, C, and D only, and patients were unavoidably missed on occasion. Nine patients had one pair of readings missing and five had either two or three of nine possible readings missing. However, sufficient data for analysis was obtained on forty-one patients with interesting results. The effect of the promazine upon systolic blood pressure was examined for statistical significance. For all three wards, a greater proportion of drug than placebo patients had postural declines exceeding 30 mm. of mercury, in fact, significantly so.[18] It is, therefore, obvious that the possibility of postural faintness appears to be present in the drug group fairly frequently. In actuality, however, frank syncope was observed only once in the entire study.

Miscellaneous Observations. — The industrial therapist, who was also unaware of which patients were on the drug, was asked to prepare a report indicating change in industrial therapy assignment and his evaluation of performance. This was an area of patient activity which could not be fully reached by the psychiatric aide using the L-M Scale since the majority of industrial therapy assignments are off the home ward. The industrial therapist report indicated the following: (1) approximately the same number of patients in each group were on prescribed industrial therapy assignment, both at the beginning and at the end of the study; (2) according to his evaluation, an approximately equal number (about one-half) of treatment and control patients had "improved" in their industrial therapy assignment during the study.

Likewise, liberty status and home visit status in these patients did not significantly change during the course of the study. One patient was discharged who was on drug but the discharge was a placement on a work-farm and had been arranged prior to the study, and his inclusion in the study was erroneous for this reason. One patient was clinically observed to improve considerably during the course of the study although her L-M Scale did not reflect this improvement. She was started on Chlorpromazine at the end of the study, and discharged in fairly satisfactory remission three months later. This is the only patient discharged from the group during a one-year follow-up. This points up what a severely and chronically ill group these patients represent.

Summary and Conclusions

From April 1 to August 1, 1957, the phenothiazine derivative, promazine, was evaluated in a double blind study. Specifically evaluated were psychiatric effect, neurotoxicity, and hematopoietic and hepatic toxicity. The study concerned sixty chronically ill schizophrenic patients, eighteen women, 42 men, ranging in age from nineteen to sixty years. These patients were randomly divided into two groups (except as modified by blocking for ward and sex): the prior therapies—lobotomy and REST, and a group who had received neither of these therapies. A maximum dose of 800 mg. per day was used, except in the case of four patients who had seizures whose dose was maintained at 400 mg. per day. The following conclusions are drawn: The psychiatric effects of promazine in this dose for this group of patients was not clinically significant. In three of the four wards, including the ward for women, no statistically significant effect was observed (as measured by the L-M Scale). In Ward C, a male ward, statistically significant changes of a favorable nature were noted on the L-M Scale. This was especially true for the group who had received neither REST nor lobotomy. Despite this improvement in L-M Scale performance, no significant clinical benefit was noted in terms of detectable clinical change, change in industrial therapy status, or discharge potential.

Muscle rigidity, tremor, or masked facies were not noted. Excess salivation was observed in four treatment patients. In two of these, a severe ulcerative stomatitis occurred, which may have been coincidental, but appeared to be related to the excess salivation.

Grand mal seizures occurred in four patients on the drug, and in none of the placebo patients. However, this difference was not statistically significant.

Mild to moderate postural hypotensive effect was observed in many treatment patients, but syncope occurred in only one patient during the entire study.

Agranulocytosis, hepatic toxicity, allergic reactions, or photo-sensitivity were not noted.

Acknowledgment

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References

1. Fazekas, J. R., Schultz, J. D., Sulliven, P. D., and Shea, J. G.: Management of acutely disturbed patients with promazine. J.A.M.A., 160:46-49 (April) 1953.
2. LaMere, Frederick: Promazine (Sparine) in the treatment of psychiatric disorders. Northwest Med., 55:790 (July) 1956.
3. Barsa, J. A., and Kline, N. S.: Promazine in chronic schizophrenic patients. Am. J. Psychiat., 113:654 (Jan.) 1957.
4. Frain, M. D.: Promazine treatment of chronic psychosis. J. Nerv. & Ment. Dis., 125:529-533 (Oct.-Dec.) 1957.
5. Rudy, L. H., Himwich, H. E., and Tasher, D. C.: Clinical evaluation of promazine and mepazine. Am. J. Psychiat., 113:979-983 (May) 1957.
6. Sibilio, J. P., Andrew, G., Dart, D., Moore, K. B., and Stehman, V. A.: Treatment of chronic schizophrenia with promazine hydrochloride. A.M.A. Arch. Neurol. & Psychiat., 78:419-424 (Oct.) 1957.
7. Pollock, Benjamin: Recurrent thorazine-induced agranulocytosis. Am. J. Psychiat., 113:557 (Dec.) 1956.
8. Reinhart, M. J., Silverstein, B. S., and Cross, T. N.: A case of agranulocytosis following Sparine administration. Am. J. Psychiat., 114:462 (Nov.) 1957.
9. Lucero, R. J., and Meyer, B. T.: A behavior rating scale suitable for use in mental hospitals. J. Clin. Psychol., 7:250-254 (July) 1951.
10. Lucero, R. J., and Meyer, B. T.: A validation study of the L-M Fergus Falls behavior rating scale. J. Clin. Psychol., 9:192-194 (April) 1953.
11. Lindquist, E. F.: Design and Analysis of Experiments in Psychology and Education. Boston: Houghton-Mifflin Co., 1953.
12. Stevens, W. L.: The distribution of entries in a contingency table with fixed marginal values. Ann. Eugenics, London, 8:238, 1938.
13. Todd, J. C., and Sandord, A. H.: Clinical Diagnosis by Laboratory Methods. 10th Ed. p. 111. Philadelphia and London: W. B. Saunders Co., 1944.
14. Forrest, F. M., and Forrest, Irene S.: A simple test for detection of chlorpromazine in the urine. Am. J. Psychiat., 113:931 (Apr.) 1957.
15. Fazekas, J. F., Shea, J. R., Ehrmantraut, W. R., and Alman, R. W.: Convulsant action of phenothiazine derivatives, J.A.M.A., 165:1241-1245 (Nov. 9) 1957.
16. Schlichter, W., Bristow, M. E., Schultz, S., and Henderson, A. L.: Seizures occurring during intensive chlorpromazine therapy. Canad. M.A.J., 74: 364-366 (Mar. 1) 1956. (Abstract in Digest of Neurol. & Psychiat., p. 176 (April) 1956).
17. Fabisch, W.: The effect of chlorpromazine on the EEG of epileptic patients. J. Neurol., Neurosurg. & Psychiat., 20:185-190 (Aug.) 1957. (Abstract in Digest of Neurology & Psychiatry, p. 509 (Nov.) 1957).
18. Fisher, R. A.: Statistical Methods for Research Workers. 7th Ed. London: Oliver & Boyd, 1938.

The Human Female: Anatomy of Sexual Response

The phases (excitement, plateau, orgasm, resolution) of woman's sexual response are described with particular reference to changes in breasts and pelvic structures.

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SUCCESSFUL sexual stimulation of the human female initiates a generalized physiological response throughout the entire body. The present discussion of specific anatomical reaction will be confined to the primary and secondary organs of sexual response—the breasts and the pelvic reproduction tract. The response of the reproductive viscera is one of marked vaso-congestion, just as penile erection is vaso-congestive evidence of the human male's response to effective sexual stimulation.

Although penile erection is the primary response of the male to effective stimulation, the female exhibits multiple primary and secondary anatomical reactions during the varying phases of a complete orgasmic response cycle. Descriptive terminology has been developed by the Washington University Sex Research Project to delineate the female's sexual response cycle. This was found necessary in order that the reactions of the breasts and the pelvic reproductive organs to mounting sexual tension might be more effectively described from an anatomical point of view. It has become evident that many of the human female's definitive anatomical reactions to sexual response are fleeting, and frequently may be confined to only one of the four phases of the total orgasmic response cycle.

The human female's sexual response cycle has been arbitrarily divided into four separate phases.[1] These phases are, in order: excitement, plateau, orgasm, and resolution. The excitement phase may vary in length from a few minutes to a matter of several hours depending upon the intensity, and the continuity of the sexual stimulation techniques employed to develop the individual female's anatomical responsiveness. This first phase of the orgasmic response cycle is measured from the onset of any form of sexual stimulation (psychic or physical), until the human female enters her second or plateau phase of response. The plateau phase is generally a much shorter time reaction sequence, during which the female gathers physiological and psychological strength from the stockpile of mounting sexual tension, until she can direct all her physical and mental forces toward a leap into the third, or orgasmic phase of sexual tension expression.

The actual orgasmic phase may last from three to eight or even ten seconds in its entirety. Obviously, the more extended the orgasmic phase response, the more severe the physiological and anatomical reactions which have developed within the responding female's body. The fourth and final phase of the sexual response cycle, resolution, is roughly proportional in time sequence to the first or excitement phase. When a short excitement phase is followed in rapid sequence by plateau and orgasm, resolution in its turn will tend to be a short-lived affair. If, however, a lengthy excitement phase is followed only by plateau phase achievement at best, with no orgasmic phase relief, resolution from this unrelieved sexual tension level will inevitably develop into a lengthy and frustrating experience.

Breasts

When we consider the response of the breasts to effective sexual stimulation, the most notable development during early excitement phase is that of nipple erection. It is important to emphasize, however, that erection of breast nipples is not necessarily a response restricted to sexual stimulation alone. The breast nipples may undergo erection in cold weather, or subsequent to immersion in cold water. The erection phenomenon has frequently been observed upon the removal of an excessively binding undergarment, or subsequent to the continued pressure of sleeping in an abdominal position. There are many women who have inverted nipples incapable of erection; so this erection reaction is not a constant finding, nor when it develops is it confined alone to the excitement phase of sexual response. It is present throughout the entire sexual response cycle.

As tension mounts under any continued effective stimulation technique, the areolae (the colored areas of the breasts surrounding the nipples) become quite puffy or engorged. This engorgement reaction creates the false impression that the primary nipple erection has been lost. Actually, the areolae become so swollen that the erect nipple is partially obscured, and a false suggestion of loss of the nipple erection reaction is returned to the observer.

The breasts increase in size slowly by the process of trapping or slowing the venous blood flow until they are frequently noted to be from a fifth to a quarter increased in size over their basic norm, by the time the excitement phase has reached its terminal stages. In large breasts, this congestive increase becomes more noticeable. There are increased venous markings on the surface of the breasts early in the excitement phase, as the blood vessels become engorged with the slowed venous blood flow. After the excitement phase ends, and the plateau phase is established, a measle-like rash spreads from the upper abdomen over the breasts, usually appearing first on the inferior breast surfaces. During the remainder of the plateau and orgasmic phases, the development and spread of this measle-like rash is a characteristic of effectively applied sexual stimulation. This vasomotor phenomenon (sexual flush) is usually better demonstrated by the blonde or redheaded female than by one of brunette coloring. There is no particular breast response to the actual orgasmic phase of the sexual cycle. However, the sexual flush does reach its maximum spread as the orgasmic reaction phase develops.

As the resolution phase is experienced, the breasts return to their normal size in a slow involution reaction that is the direct reversal of the previously described excitement phase changes. First to disappear is the measle-like skin rash. Second to be lost is the increased breast size. The aerolae then begin to lose their engorged, swollen appearance. Finally, the nipples which have been almost hidden by the swollen aerolar area again appear to undergo an erection response. This is actually a false erection reaction. The erect nipples are simply the last evidence of sexual tension to leave the involuting breasts, after an orgasmic experience has released the venous engorgement developed during the first two phases of the complete sexual response cycle.

We might emphasize here a point of telltale evidence of effective sexual stimulation. As the human female is responding to sexual stimulation, the appearance of pink, granular rash may frequently be noted over the anterior chest wall and the breasts. A certainty of effectual sexual stimulation may be presumed, in the physiological response situation described. Unless the female is most adequately stimulated, she will not produce the measle-like rash (sexual flush) which is a true measure of the development of severe sexual tension.

The External Pelvic Anatomy

The response of the female pelvic reproductive anatomy to effective sexual stimulation may also

be described in relation to the four phases of the sexual response cycle. The external sexual anatomy includes the clitoris, the major and minor labia, and the Bartholin glands which are located on the inner aspect of the labia about two-thirds of the way from the clitoris to the posterior vaginal wall. The anatomical reactions of these target organs to sexual tension will be described in detail.

The clitoris is a small, sensitive organ consisting primarily of erectile tissue. It varies considerably in tissue content (generally about the size of a green pea), and is located on the antero-inferior surface of the large pelvic bone (the symphysis pubis) which runs across the front of both male and female pelves. The clitoris is covered by the folds of the labia (the prepuce) meeting in the midline just above the urinary outlet (the urethra). The prepuce protects the clitoris in the same manner that the foreskin protects the glans or head of the male penis. The clitoris and prepuce form the most universally erotic area of the female body.

As sexual tension mounts, the clitoris increases in size, but this response has great individual variation. Occasionally, the increase may be minimal. but frequently a two or three times increase in size has been observed. This response is another example of the trapping of venous blood flow by a target organ, developing subsequent to effective sexual stimulation. This small, sensitive organ has a tremendous blood circulation for its size. The increase in clitoral size is usually completed by the time the excitement phase has terminated.

No particular plateau or orgasmic phase response has ever been described for the clitoris. During the resolution phase the marked venous engorgement is lost very slowly. Frequently, the clitoris is the last of the pelvic sexual anatomy to return to normal size after a period of effective sexual stimulation. This is particularly true if the female does not attain the sexual tension relief of an orgasmic experience. Those women who experience long excitement and excessively extended plateau phases, and then must undergo an extended resolution phase without orgasmic relief, frequently take hours to lose the venous congestion of the organs of sexual response.

The major labia follow a relatively precise pattern of anatomical response to sexual stimulation. This reaction varies (as a general rule) with the number of children the individual female has produced. For the nulliparous female (no children), the major labia thin out and flatten upward and backward against the pelvic brim during advanced stages of the excitement phase. As the plateau phase is experienced, the major labia are, for all clinical purposes, a non-existent entity. However, for the multiparous individual (more than one child), particularly if there are significant labial varicosities present, the labia majora increase in size from two to three times, as the usual venous engorgement reaction develops. Then, the labia hang like the folds of a heavy curtain about the vaginal outlet. There is a tendency (even for markedly engorged, multiparous labia) to spread laterally as the plateau phase is anticipated, making the vaginal outlet more available to the mounting process. Again, as with the clitoris, there is no specific plateau or orgasmic phase response from the major labia. Resolution, with return to normal anatomical position and size, occurs more rapidly for the nulliparous than for the engorged, multiparous labia.

The anatomical response of the minor labia to effective sexual stimulation has been of particular interest to investigators. The unique sexual response of this target organ has been dubbed the "sex-skin" reaction of the human female.[1] Comparison has been drawn to the labia of the monkey bitch in heat.[2] The response of the monkey bitch (when ready to receive the male) is one of muted red discoloration of the entire vulval area. During the human female's excitement phase, the minor labia increase in size from two to three times their normal thickness, and extend laterally to provide additional support along the axis of the lateral vaginal walls. This reaction actually develops an additional centimeter or centimeter and a half of effective coital length for the vagina. The exception to this additional support is, of course, along the immediate posterior vaginal wall.

After the plateau phase has been achieved, there is a marked color change in the minor labia. Again there is variation with the parity (number of children) of the individual human female. The minor labia of the nulliparous female may turn a cardinal red, as the plateau phase advances. The minor labia of the multiparous female (particularly if there are marked vulval varicosities) may turn almost a burgundy-red instead of a cardinal color. These color changes are always evidence of an impending orgasmic experience.

If the individual female moves from the excitement to the plateau phase, and then unfor-

tunately does not achieve the sexual tension release resulting from a completed orgasmic experience, the color changes just described for the minor labia do not occur. If, however, the minor labia change color during an established plateau phase, and if the effective sexual stimulation techniques that have brought about these color changes are maintained, the human female will always undergo an orgasmic experience. In other words, once the minor labia establish the color changes of severe sexual tension, an orgasmic experience is not only imminent, but is sure to occur, if the particular sexual stimulation techniques are maintained. Usually, from the onset of the color changes described for the minor labia to the onset of the actual orgasmic phase response, only sixty to ninety seconds are consumed.

There is no particular anatomical reaction for the minor labia to the actual orgasmic experience. The resolution phase is again the complete reversal in anatomical sequence from the excitement phase. In other words, the first anatomical change of the resolution phase is for the minor labia to lose the sex-tension discoloration. Then the minor labia lose their vascular tension (increased size), and return slowly to normal positioning and size.

The Bartholin glands secrete a mucoid type of material under the influence of effective sexual stimulation. It has been previously believed,[3-7] that this is an early excitement phase response to sexual stimulation. But these conceptions are in error. The Bartholin glands do not secrete during the excitement phase of the sexual response cycle unless it is maintained for a markedly extended time sequence. The usual onset of glandular secretory activity is during the plateau phase of female sexual response. The material liberated is at most three or four drops from either Bartholin gland. There is no particular orgasmic phase response, and the short resolution phase reaction simply consists of cessation of secretory activity.

The Internal Pelvic Anatomy

The internal pelvic anatomy of the organs of reproduction consists of vagina, cervix, uterus, fallopian tubes and ovaries. As yet, nothing is known of actual anatomical response of the tubes and ovaries to the influence of sexual tension. The anatomical reactions of the vagina, cervix, and corpus to sexual stimulation will be described in detail.

Probably the first definitive anatomical response of the entire female body to sexual stimulation develops within the vagina. Within ten to twenty seconds after the onset of any form of effective sexual stimulation, the vagina begins its well-known process of lubrication. Previously, it was believed that lubrication of the vagina either came from the Bartholin glands, or was the result of cervical mucous secreted by glands within the cervical canal.[8-14] It is now well-established that the lubrication of the vaginal barrel comes from the walls of the vagina itself[1] despite the fact that there are no secretory glands within the walls of the vagina.[15] Therefore, the actual anatomical source of the lubricating material is still in question, as are the biological properties of this unidentified material. However, the actual physical mechanism of vaginal lubrication has been repetitively observed, and may now be described in effective anatomical detail.[16]

Almost immediately after the onset of sexual stimulation, the vagina develops what has been termed "the sweating-phenomenon."[1] On the vaginal walls appears a glistening material which follows in general the pattern of a transudate reaction. This material is of such consistency that it changes the normal acidity (pH) of the vagina.[16] When it first appears on the walls of the vagina, one is reminded of a "sweat-beaded" forehead. Within short order, these droplets of lubricating material coalesce to form the well-lubricated vaginal barrel, which connotes advancing sexual tension. This lubrication phenomenon obviously develops very early in the excitement phase of any cycle of sexual response, and is present in varying degree whether or not the subject actually achieves orgasmic satisfaction. The resolution phase reaction is simply one of cessation of the secretory activity. However, the lubricating material has been demonstrated on collapsed vaginal wall surfaces two to three hours after completion of a successful sexual response cycle.

During the more advanced stages of the excitement phase, a consistent anatomical reaction develops within the inner two-thirds of the vagina. There is marked expansion not only in depth, but in width of the lateral walls of the vagina with mounting sexual tension. The ballooning of the vaginal walls increases the width of the inner two-thirds of the vagina from two to three times the unstimulated width. The length of the vagina is increased from two to four centimeters depending upon previous childbearing experience. This

increase of length and width occurs within the vagina as the result of a jerky, arrhythmic display of expansive force without any reproduceable pattern. This evidence of muscular activity occurs independently from the basic vasocongestive reaction to mounting sexual tension. The vaginal expansion reaction is essentially concluded by the time the plateau phase is reached. Thereafter, there are no further significant changes in the inner two-thirds of the vagina during the remainder of the sexual response cycle.

During the plateau phase, the vaginal responses are confined to the external third of the vagina. Here a marked vasocongestive reaction develops. The entire vaginal canal is congested to such a degree that the circumference of the outer third of the vagina is constricted to a third or a half of its previous excitement phase distension. The congested outer third of the vagina has been termed the orgasmic platform.[1] This orgasmic platform only develops as the plateau phase progresses. Once formed, however, it demonstrates the only significant vaginal reaction to the actual orgasmic phase of sexual response. During the orgasmic experience, the platform created in the outer third of the vagina by marked congestion of venous blood flow actually contracts with a recordable rhythmicity. The timing sequence essentially corresponds to the contraction of the male penis with actual ejaculatory effort (the male orgasmic experience). The orgasmic platform contracts from four to ten times in regular rhythm with approximately eight-tenths of a second between contractions. The more platform contractions noted, the more severe the orgasmic experience.

During the resolution phase, the first evidence of loss of target organ venous congestion is that of the orgasmic platform. The engorged outer third of the vagina rapidly shrinks back to normal size after orgasmic experience. Although the detumescence is not quite as rapidly completed as is the loss of penile erection after the male ejaculation, the orgasmic platform disappears within sixty to ninety seconds after orgasmic phase relief of sexual tension. The expansion of vaginal depth and width which developed during advanced stages of the excitement phase slowly involutes. Frequently, it takes five to eight minutes for the vagina to return to its normal unstimulated measurements. Vaginal lubrication activity ceases with orgasmic expression, although the lubricating material may be demonstrated on the walls of the vagina for an hour or two after completion of the cycle of sexual response.

The only remarkable cervical response to sexual stimulation is movement in conjunction with the reaction of the entire uterus. There is no secretory activity from the cervical glands at any time during the entire cycle of sexual response.[1] The cervix is pulled back and away from the vaginal outlet and upward toward the false pelvis, as part of total uterine movement during advanced excitement phases. This observed withdrawal of the cervix from the vaginal axis occurs at the same time that the vagina expands in width and depth. There is no characteristic response of the cervix to the plateau phase of sexual excitement. Immediately subsequent to orgasmic experience, a slight patulousness (opening) of the external cervical os has been described.[1] Again, it is worth emphasizing that no secretory activity of the cervical glands has been demonstrated. With development of the resolution phase, the cervix drops down into the depth of the vagina as the vaginal barrel loses its distension. This return of the cervical os to the vaginal floor is subsequent to loss of vaginal wall vasocongestion, and the collapse of depth and width expansion.

The uterus is pulled upward into the false pelvis during the terminal stages of the excitement phase. This elevation of the uterus only occurs in those instances when the uterus is in a normal anterior position. If the uterus is in a retroverted position (resting posteriorly on the bowel, rather than anteriorly on the bladder), there is no elevation of this target organ and, of course, no concomitant withdrawal of the cervix from the vaginal floor. There has been no particular plateau phase response demonstrated for the uterus. However, during the orgasmic phase, there is a regular contraction sequence of the uterine wall.[18] This is similar to the established contraction reaction of the orgasmic platform in the outer third of the vagina. This anatomical indication of sexual tension release is particularly effective, and easily demonstrated in the pregnant uterus. The contraction of the uterus as an anatomical orgasmic phase response may well be one of the real causes (in susceptible individuals) for multiple pregnancy loss, particularly during the first three months after conception. Uterine activity during the resolution phase parallels the pelvic relaxation reaction. There is a return to normal uterine posi-

tioning as the vaginal walls collapse. The muscular control of the withdrawal reaction of the corpus into the false pelvis, as sexual response develops, is not at present completely understood.

It is obvious from the recent demonstration of muscle tissue in the sacrouterine ligaments,[17] that these ligaments may well play a part in the elevation of the cervix and corpus. The base of the broad ligaments (Malencrodt's ligaments) are also suspected as playing a major part in the elevation of the lower uterine segment while the vagina expands in width and length under the influence of increasing sexual tension.

From the brief anatomical descriptions of the responses of the reproductive organs to effective sexual stimulation, it will be noted that the primary reaction is one of marked slowing and trapping of local venous blood flow. It should not be presumed however, that the only anatomical responses to sexual stimulation are confined to the obvious target organs. Far from it, really. The human female responds as a total body unit to effective physical and/or psychic sexual stimulation.

Although limitations of space do not permit detailed descriptions of the human female's generalized body reactions to sexual tension, a few selected examples are in order. For example, the measle-like rash (sexual flush) which appears over the surfaces of the breasts, during the plateau phase of sexual tension response, is by no means confined to the breast surfaces. As a matter of fact, this rash first appears over the upper abdomen and the diaphragm areas, then spreads to the breasts. This flush may also be noted over the arms, face, back, buttocks and thighs as severe tension reactions develop during the terminal portions of the plateau phase of the cycle of sexual response. This generalized flush rapidly disappears early in the resolution phase provided orgasmic tension release has been experienced. If no orgasmic experience has been enjoyed, the flush disappears at a significantly slower rate from the body surfaces.

The actual orgasmic experience is enhanced by generalized muscular contraction patterns far beyond the rhythmic contractions of the previously mentioned orgasmic platform and the uterus. The external rectal sphincter contracts in complete rhythm with the orgasmic platform during severe, orgasmic phase responses. Many other muscle groupings, too numerous to mention here, develop a spastic contraction state throughout the entire pelvis and the lower abdomen, as the individual reaches for orgasmic relief of her unendurable sexual tension. Even the musculature of the neck, hands, arms, feet and legs have their own individual spastic contraction pattern response to effective sexual stimulation.

The corded neck muscles, the swollen flushed face, and the expanded rib cage are familiar pictures of total female sexual tension response. In brief, the female target organs respond anatomically just to the degree that the total female is sexually stimulated. The more effective the sexual stimulation techniques are for the individual woman, the more complete her total body response is to the physiological and psychological demands for sexual tension release.

Bibliography

1. Masters, W. H.: The sexual response cycle of the human female. I. Gross anatomical considerations. West. J. Surg. Obst. & Gynec. (In print).
2. Zuckerman, S.: The menstrual cycle of the primates. Proc. Zool. Soc., 691, 1930.
3. Brown, Fredrich R., and Kempton, Rudolph T.: Sex Questions and Answers. New York: McGraw-Hill Book Co., 1950.
4. Von Hornstein, F. X., and Faller, A.: Gesundes Geschlechts Leben. Otten, Switzerland: Otto Walter, 1950.
5. Moll, A.: The Sexual Life of the Child. New York: The Macmillian Co., 1912.
6. Stone, Hannah M., and Stone, Abraham: A Marriage Manual. New York: Simmon and Schuster, 1953.
7. Weisman, Abner I.: Spermatozoa and Sterility. New York: Paul B. Hoeber, Inc., 1941.
8. Bauer, B. A.: Women and Love. (E. S. Jerdan, and E. C. Paul, Trans.). New York: Liveright Publishing Corp., 1927.
9. Bloch, I.: The Sexual Life of Our Time in Its Relations to Modern Civilization. London: Rebman, 1908.
10. Dickenson, R. L.: Human Sexual Anatomy (Second Edition, 1949). Baltimore: Williams and Wilkins Co., 1934.
11. Ellis, Havelock: Studies in the Psychology of Sex. 4 vols., New York: Random House, 1936.
12. Kinsey, A. C., Pomeroy, W. B., Martin, C. E., and Gebhard, P. H.: Sexual Behaviour in the Human Female. Philadelphia: W. B. Saunders Co., 1953.
13. Negri, V.: Psychoanalysis of Sexual Life. Los Angeles: Western Institute of Psychoanalysis, 1949.
14. Siegler, S. L.: Fertility in Women. Philadelphia: J. B. Lippincott Co., 1944.
15. Maximov, Alexander A., and Bloom, William: A Text Book of Histology. Philadelphia: W. B. Saunders Co., 1930.
16. Masters, W. H.: The Sexual Response Cycle of the Human Female. II. Vaginal Lubrication. New York: New York Academy of Science (In print).
17. Krantz, Kermit: Observations on the Gross and Microscopic Anatomy of the Vagina. New York: New York Academy of Science, 83:301-317, 1959.
18. Masters, W. H.: Unpublished data.

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Fig. 1. *(left)* X-ray of abdomen showing breech at seven and one-half months gestation and abnormal calcification in maternal pelvis. Fig. 2 *(right)* Enlargement of x-ray in Figure 1 clearly demonstrating bones and two teeth in pelvic mass.

Ovarian Dermoid Cyst Complicating Pregnancy

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DERMOID CYSTS constitute about 10 per cent of all ovarian tumors.[1] They may occur at any age period, and about 25 per cent are bilateral.[2] These tumors when removed, are usually the size of a man's fist, are slow growing, and possess a marked pedicle which is liable to undergo torsion. Pathologically, these tumors are a form of teratoma and are supposed to arise not from the original ovum, but from one of the blastomeres formed by primary segmentation of the fertilized ovum becoming separated and included in the ovary.[1] The exterior of the tumor is smooth, and glistening, and the interior is filled with a yellow, greasy, buttery material frequently containing wisps of hair, teeth, bones, cartilage, skin, brain, and occasionally striated muscle and thyroid tissue. The tumor itself is almost always benign although it has been reported that some of the epithelial elements may undergo malignant change.

The problem of these cysts can be potentially serious if they are undetected during term labor, as it is quite feasible that a large dermoid could become incarcerated in the posterior cul-de-sac and obstruct the pathway of normal delivery.[3] The tumor could burst, setting up a fatal peritonitis, or it could undergo torsion with subsequent necrosis.[4] Sometimes smaller cysts are drawn out of the way during pregancy and these seldom cause symptoms unless they are severely bruised. When patients are seen within the first five months of pregnancy and an ovarian dermoid is diagnosed, pelvic laparotomy should be done and the cyst removed. If the tumor is detected late in pregnancy, the management should be altered and caesarean section, near term, is advised with incidental removal of the tumor.[5] Any malpresentation of the fetus near term should make one suspicious of ovarian tumor as the cause of failure of engagement of the presenting part along with other causes such as placenta praevia, myomata, and cephalo-pelvic disproportion to mention a few.

Blackwell carefully analyzed data on 225 pa-

tients who had cystic teratomas or dermoid cysts of the ovary at the Mayo Clinic and found that in two cases, delivery was complicated by dermoids measuring 8 cm. and 9 cm. in diameter; in both cases mechanical difficulty was encountered. One patient required manual displacement of the tumor to allow the head to engage. The other required Caesarean section.[6] Batson reviewed 108 cases of ovarian dermoids and found that four cases were associated with full-term pregnancy and that three of these patients were sectioned because of the possibility of obstructed vaginal delivery or rupture. Curiously, in fifteen of the 108 cases studied, the diagnosis was confirmed by x-ray examination.[7] Thirty-one per cent of the dermoids removed at the Mayo Clinic in Blackwell's study revealed teeth microscopically and grossly, so that the finding of teeth in the x-ray picture should make the diagnosis almost absolute. Wilson reported a case of ruptured dermoid cyst during the twentieth week of pregnancy proved at laparotomy and followed by a very stormy bout of peritonitis. The patient recovered and delivered a live infant later at term.[8]

The following case history will illustrate some of these points.

Mrs. W. A., a nineteen-year-old primigravida was seen for the first time by the author on May 15, 1958. She gave the history that she was not certain as to the time of her last menstrual period, but thought it was in early January, 1958, or in December, 1957, and that her menses had always been irregular since their onset at age twelve. She stated that she felt fetal movements for about one month prior to her first visit. A general physical examination, including the usual laboratory work, gave negative findings, except for the presence of a gravid uterus which seemed to be at least the size of a seven months' gestation, and a fetus lying in the frank breech position. Pelvis examination revealed a marked fullness in the posterior cul-de-sac, and the cervix was high under the symphysis pubis barely visible with the use of a bi-valve vaginal speculum. The fetal heart was of good quality, and the patient had no other unusual symptoms. On June 10, 1958, a flat radiograph of the abdomen was taken after a repeat pelvic examination was performed, and a single fetus lying in the frank breech position was diagnosed along with abnormal calcification in the maternal pelvis. The flat radiograph was taken only because the author was uncertain as to the maturity of the pregnancy as well as to the possibility of the presence of a multiple pregnancy since the patient seemed more advanced in fundal height than the history and dates would have indicated. On closer inspection of the flat radiograph (Figs. 1 and 2), it became obvious that the pelvic mass was an ovarian dermoid. On July 8, 1958, consultation was obtained, a repeat vaginal examination was done, and in view of the roentgenogram, a definite mass in the left ovary was easily palpable and measured at least 12 cm. in diameter.

On August 6, 1958, at the Union Hospital, New Ulm, Minnesota, a low cervical Caesarean section was performed under local and light sodium pentothal anesthesia, and an active male infant weighing 7 pounds, 15 ounces was easily delivered as a frank breech presentation. The left ovary was excised, and this proved to be grossly and histologically a dermoid cyst containing sebaceous material, teeth, hair, bones and cartilage. It measured 10 by 12 cm. in size. The patient made a completely uneventful recovery and was dismissed from the hospital on the seventh postoperative day. The microscopic diagnosis was that of a benign dermoid cyst as interpreted by the late James McCartney, M.D., of the Department of Pathology, University of Minnesota Hospitals.

Summary and Discussion

The case of a nineteen-year-old primigravida with a large dermoid cyst complicating advanced pregnancy is presented. The findings of abnormal fetal presentation, questionable maturity or advancement of the pregnancy, abnormal x-ray findings with clear demonstration of teeth and bones, led to the diagnosis of this tumor and its ultimate management. Despite the widespread fear of the use of roentgenograms during pregnancy, it is self evident that in this particular case, an x-ray examination made the diagnosis quite simple. The differential diagnosis should include any cause of abnormal pelvic calcification such as calculi in an ectopic pelvic kidney, calcified myomata, lithopedion from a previous abdominal pregnancy, and of course, teratoma or dermoid cyst. As to future pregnancy in the case illustrated, it is thought that because of an ample gynecoid pelvis, adequate hemostasis and primary afebrile wound healing, a vaginal delivery, with careful observation during all stages of labor, should be allowed.

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Bibliography

1. Boyd: Surgical Pathology. 6th Edition, p. 502. Philadelphia: W. B. Saunders Co., 1947.
2. Novak and Novak: Gynecologic and Obstetric Pathology. 4th Edition, p. 454. Philadelphia: W. B. Saunders Co.
3. De-Lee Greenhill: Principles and Practice of Obstetrics. Eighth Edition, pp. 546-547. Philadelphia: W. B. Saunders Co., 1943.

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The Continuing Challenge of Streptoccal Infections and their Complications

Medical Progress

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THE remarkable changes in the natural history of many infectious diseases following the introduction of antibiotics can be fully appreciated only by those who have witnessed the change from beginning to end. Some diseases have virtually disappeared; others have been modified; still others have emerged as newly important entities. Not all changes have been for the good and not all have been dramatic. Among the most interesting changes are those which are subtle rather than dramatic. Some of the most fascinating observations concern the ability of certain organisms to escape extinction even though they are among the most sensitive to antibiotics.

The group A streptococcus is such an organism. Like the pneumococcus, it is exquisitely sensitive to penicillin. Yet it continues to survive, continues to result in widespread infection, and continues to lead to serious complications—acute rheumatic fever and acute glomerulonephritis.

The Problem in Minnesota

The problem of streptococcal infections and their complications is with us in Minnesota today. And, in spite of our antibiotic attacks, there is no indication that they will surrender any time in the immediate future. Indeed, this winter and spring has been one of the biggest streptococcal disease years Minnesota has seen in some time. Pharyngitis and tonsillitis of streptococcal etiology have been common in many communities, and in many sections of the state we have even seen the return of the red banner of streptococcal disease, scarlet fever. In conjunction with this upsurge of streptococcal infection, there has been an apparent increase in the incidence of acute nephritis, in particular, and most likely also in rheumatic fever. The common belief that rheumatic fever is dying out in Minnesota and elsewhere is due to the fact that no one physician sees very many patients with acute rheumatic fever among his patient population. This faulty impression is also due to the fact that rheumatic fever in general appears to be a milder disease—probably because we are now able to protect patients against recurrent attacks. However, optimistic belief that rheumatic fever is in its terminal stages is not justified. This is borne out by the recent survey made by our State Department of Health in co-operation with the Minnesota State Medical Association and the Minnesota Heart Association. This survey was first made in 1955 and repeated in 1958. Many of you participated in it and many of you are familiar with its results.

Minnesota Medical Foundation Lecture presented at the annual meeting of the Minnesota State Medical Association on May 26, 1959.

From this survey, it is conservatively estimated that the physicians of Minnesota are seeing about 3,000 new attacks of acute rheumatic fever each year.[1] This amounts to about one case of acute rheumatic fever in every thousand individuals each year. Although we have no comparable figures for ten or twenty years ago, rheumatic fever can hardly be called a dying disease.

Next, I should like to examine some of the reasons why streptococcal infection, acute rheumatic fever, and acute nephritis, continue to be problems with which we are faced. In searching for answers to this question, we shall examine some of the peculiar biologic properties of the streptococcus, its rather unique chemical makeup, the features which determine its ability to spread from one individual to another, and the extreme variability in clinical response to streptococcal infection which results in no apparent disease in some individuals, mild respiratory symptoms in others, frank tonsillitis in some, scarlet fever in relatively few instances, and occasionally serious late complications such as acute rheumatic fever and acute nephritis. Since we are in the age of widespread use of antibiotics, all of this must be considered in the light of how the streptococcus reacts to penicillin and other antibiotics.

Complexity of Streptococci

Bacteriologists who have attempted to dissect the streptococcus have found it to be a much more intricate organism than the simple chain of cocci which appear on the gram stain. In spite of their small size, these bacteria are complex in biochemical structure.[2] Not too many years ago, we thought of streptococci as producing one toxin, the erythrogenic toxin of scarlet fever. Now we know that hemolytic streptococci produce a large group (at least twenty-three) well-defined biologically-active substances. Many of these substances are both antigenic and sensitizing, resulting in the production of specific antibody and hypersensitivity responses. Many of them are specific enzymes which break down various chemical substances in their environment. To mention but a few of the products of this "enzyme factory," the streptococcus produces two different products which hemolyze red cells, another product which degrades a component of synovial fluid and connective tissues (hyaluronic acid), another enzyme which digests protein, another enzyme which activates a proteolytic system of normal human serum, and three enzymes which destroy DNA (desoxyribonucleic acid), the genetic substance of chromosomes. Except for the erythrogenic toxin (which is apparently the cause of the rash in scarlet fever), we know virtually nothing about how these streptococcal products relate to the signs and symptoms of the clinical disease and its complications.

The streptococci which result in infection of the upper respiratory tract in man are called hemolytic or *beta*-hemolytic streptococci. They produce a clear zone of hemolysis on blood agar plates and must be carefully differentiated from the normal streptococcal inhabitants of the upper respiratory tract which produce an *alpha* or green zone around the colony. Most of the hemolytic streptococci which infect man and all of those which result in complications such as acute rheumatic fever and acute nephritis are members of a single serological group. They are called group A streptococci.

However, this single group of streptococci infecting man, the group A streptococci, is composed of a large number of different types. The existence of a large number of serological types of streptococci is of practical importance, because immunity to streptococcal infection is type-specific. Infection with one type of streptococcus results in immunity to that type but does not result in immunity to the forty-odd other types. This explains why it is possible for a person to have many streptococcal infections during a lifetime. It also accounts, in part, for some of the difficulties in preparing a vaccine against streptococcal infections. With polio, we are dealing with only three types, but with group A streptococci we are dealing with more than forty different types and a complete vaccine would have to contain antigen for each of them.

Spread of Streptococcal Infections

On the average, a person has about one streptococcal infection every five years. Like many other diseases of the upper respiratory tract, streptococcal infections are most common in the school-age child. Young infants are infrequently infected, and when infected, may have a prolonged febrile illness with generalized adenopathy which is quite different from the typical picture of exudative tonsillitis and pharyngitis in the older child and adult. The normal habitat of the streptococcus is the upper respiratory tract in man. It does not parasitize other animals with the exception of primates in captivity. During the course of infection, the bacteria are found in the inflamed tissues of the

pharynx and can be cultured from the nose in about one-third of the cases. Patients who have positive nose cultures are particularly likely to result in the spread of the organism to susceptible individuals. The nasal carrier state does not ordinarily extend beyond two weeks after infection except in patients who have chronic sinusitis. After two weeks the organism may persist for long periods of time in the pharynx or tonsils, but they do not multiply rapidly and the numbers are small. Spread to another person infrequently occurs after two weeks. Persons with streptococcal infections, particularly those who harbor streptococci in the nose, will heavily contaminate the environment about them, including their skin, their clothing and bed clothing, and the air and dust of the room. These streptococci in the environment may live for long periods of time, and it would appear at first sight that this might be one reason for the ability of streptococci to survive and to spread to other individuals. However, these streptococci in the contaminated environment, although still living, are apparently not infectious. Individuals exposed to such environments do not show increased risk of infection. Moreover, when large numbers of streptococci collected from contaminated environments are inoculated into the naso-pharynx of susceptible volunteers, no infection is produced. Some factor other than the ability to survive in the environment must be responsible for the ability of this organism to spread and cause infection in man.[3]

Incidence of Complications

Although many patients with acute rheumatic fever give no clinical history compatible with a preceding streptococcal infection, the evidence is now convincing that all cases of acute rheumatic fever are preceded by a streptococcal infection. About half of these streptococcal infections are subclinical and are neither recognized by the patient nor brought to the attention of the physician. But, in these subclinical infections there is definite evidence of a preceding streptococcal infection on the basis of isolation of the infecting organism or on the basis of an antibody response to streptococcal products. When rheumatic fever follows streptococcal infection, it usually follows after a latent period of about one to four weeks with an average of eighteen days. Obviously not every patient who gets a streptococcal infection develops rheumatic fever. In certain epidemic situations it has been shown that about 3 per cent of patients who experience an untreated streptococcal infection subsequently develop rheumatic fever. Whether the patient develops rheumatic fever or not does not seem to depend upon any factor which can be related to the infecting organism, that is, it is not related to strain variation of the infecting streptococcus, the nature or the severity of the preceding infection, the season of the year or other factors. The importance of multiple streptococcal infections and of a possible genetic peculiarity in the host reaction to streptococcal infections are uncertain at present. Although in epidemic situations the incidence of acute rheumatic fever following a streptococcal infection appears to be fairly constant, the occurrence of acute glomerulonephritis is much more irregular. Indeed, in many large epidemic situations, this complication is not observed at all. This irregularity in the behavior of acute nephritis can be explained by the observation that, whereas acute rheumatic fever may follow infection with any of the types of group A streptococci, acute nephritis follows infection with only a few types of streptococci.[4] These so-called nephritogenic types include types 12, 4, 25, and a type called Red Lake, because it was first isolated on the Red Lake Indian Reservation in Minnesota in an epidemic described by Dr. Kleinman.[5] This last type has now been given the number 49. Only about 15 per cent of patients infected with a nephritogenic type will develop clinical nephritis, so that here again there must be some other factor in addition to the peculiarity of the type of streptococcus which determines whether a patient develops acute nephritis or not.

Frequency of Inapparent Infections

One of the most important factors in the ability of the group A streptococcus to survive in this antibiotic age is undoubtedly the fact that it has tended to go underground. Although scarlet fever still exists, and the disease has been rather widespread in Minnesota and other parts of the country during the past year, it is a relatively mild disease, compared with the severe, prostrating illness which occurred some years ago. Most clinically-recognizable streptococcal infection nowadays presents as a pharyngitis or tonsillitis, but it is important to keep in mind that at least half of the streptococcal infections which occur are either so asymptomatic or atypical that they escape detection. It is, therefore, impossible to recognize and to treat all strep-

tococcal infections. This means that there is a continuing reservoir of untreated infections which can result in rheumatic fever, in acute nephritis, and in further spread of infection. We know that proper treatment of streptococcal infections will prevent rheumatic fever and will greatly reduce the incidence of acute nephritis but it is impossible to eliminate these complications by a direct therapeutic approach because about half of the infections that occur are completely undetected.

Difficulties in Diagnosis of Streptococcal Infections

A second reason for continuation of the streptococcal problem is that even when symptoms and signs are present, streptococcal infections are not easy to diagnose with accuracy.[6] When we think about diagnostic problems among our patients, we do not ordinarily think about patients with upper respiratory disease, yet the differential diagnosis of the etiology of respiratory illnesses is a difficult problem. If the patient has the rash of scarlet fever, we can feel fairly certain on clinical grounds alone that the infection is due to a group A streptococcus. In all other patients, and this includes most of the patients we see nowadays, even the most experienced clinicians cannot distinguish with certainty those infections which are streptococcal in origin and those which are viral in origin. About half of the cases of tonsillitis and pharyngitis in children are due to infections with adenoviruses. These viral infections are often clinically indistinguishable from streptococcal infection. For this reason it is highly desirable to confirm the clinical impression by taking a throat culture, which is examined for the presence of hemolytic streptococci.[7] Throat cultures are relatively easy to do, remarkably inexpensive, and the results are available within eighteen hours. Since early treatment of the preceding streptococcal infection is not essential for the prevention of rheumatic fever, we can feel safe in waiting twenty-four hours or even forty-eight hours for the result of a throat culture before starting treatment in doubtful patients. Treatment can be discontinued in those patients whose culture proves to be negative for hemolytic streptococci. Discontinuance of needless therapy in such patients results in a saving far greater than the cost of the throat culture. As with all laboratory procedures, some care must be given to the technique (including the type of blood used in identifying streptococci), in order not to be misled by the results of the laboratory report. When properly done, throat cultures are extremely helpful in the differential diagnosis of infection of the upper respiratory tract.

Inadequacy of the Usual Penicilin Treatment of Streptococcal Infections

Another important reason for the continuing problem, in spite of antibiotics, concerns the nature of the reaction of group A streptococci to antibiotic therapy. In this, our thinking has been unduly influenced by laboratory reports of the sensitivity of these organisms to antibiotics, These laboratory studies have shown that all group A streptococci are highly sensitive to penicillin. We have carried this test-tube reasoning over to the patient, assuming that it should therefore be easy to eradicate streptococci from the upper respiratory tract of patients. This has not proved to be the case. When penicillin is given over a short period of time the patient feels better, and the number of streptococci in the throat is reduced, but not all streptococci are killed. This finding is of great clinical importance because it has been shown that unless all streptococci are eradicated, antibiotic treatment fails to prevent rheumatic fever. Blood levels of penicillin must be present for ten days in order to kill all group A streptococci and, even then, about 10 per cent of patients may still harbor the infectious organism in the throat. It is extremely difficult to get patients to take antibiotics beyond a period of two or three days when they are having symptoms. But this is essential for maximal protection. The physician can overcome this difficulty by giving a single injection of benzathine penicillin ("Bicillin"), the long-acting depot penicillin which assures prolonged treatment without depending upon the patient to take oral medication for ten days.

Importance of Continuous Prophylaxis in Rheumatic Subjects

Our most solid accomplishment in attempts to control rheumatic fever and rheumatic heart disease has been made in those patients who have already suffered one attack of the disease. In these established rheumatics, it is possible to afford them virtually complete protection against the ravages of repeated attacks of rheumatic fever by placing them on continuous penicillin or sulfadiazine prophylaxis.[8] It is of interest here and of clinical importance that sulfadiazine is quite ef-

fective in preventing rheumatic recurrences when given continuously to rheumatic subjects, but it is ineffective in preventing rheumatic fever when used to treat established streptococcal infections. Like short-term penicillin therapy, sulfadiazine is bacteriostatic. That is, it suppresses growth but does not eradicate the streptococci.

The prophylaxis must be continuous but may be given in any of several ways: Monthly injections of the long-acting Bicillin, daily or preferably twice-daily oral penicillin, or daily sulfadiazine. Again, the intramuscular injection has the advantage of assuring that the patient does not neglect his medication. With our present knowledge there seems to be little reason for the continuing high rate of recurrence of rheumatic fever. This rate was surprisingly high in the Minnesota survey. Forty-two per cent of the patients with attacks of rheumatic fever were recurrent attacks.[9] From this, we can estimate that Minnesota physicians see over one thousand recurrences of rheumatic fever each year. Had these patients been on prophylaxis, it seems likely that most if not all of the recurrences could have been prevented. This alarming percentage of recurrences has stirred interest in the development of a state-wide rheumatic fever prophylaxis program for Minnesota. Such a program is currently being planned by the Minnesota State Medical Association in conjunction with the Rheumatic Fever Committee of the Minnesota Heart Association and the State Board of Health.

Rheumatic subjects must be kept on *continuous* prophylaxis. One cannot rely on treatment of streptococcal infections to prevent recurrences because about half of the streptococcal infections will be subclinical and will not receive treatment. Continuous prophylaxis should be given year-round, and for maximal protection, should be continued indefinitely. Although the incidence of recurrences decreases with age, recurrent attacks do occur in older age groups.

Conclusions

From this brief review, we have seen that streptococcal infections and their complications continue to be important clinical problems even in this antibiotic era. I do not wish to belittle the contributions which penicillin and the sulfonamides have made to the control of streptococcal infections and their complications. These have proved to be highly effective in halting epidemics and in preventing recurrences in rheumatic subjects. And, judging from the number of rheumatic recurrences which develop each year in Minnesota, we still have quite a way to go before we can say that we have taken full advantage of the potentialities of drug prophylaxis.

But antibiotics can never be the final answer to the streptococcal and rheumatic fever problem. In spite of its exquisite sensitivity to penicillin, the group A streptococcus has not been obliterated. It commonly causes infections which go unrecognized because they are subclinical or atypical. It often defies eradication because, in treating infections, antibiotics are not administered for a long enough period of time. Moreover, the mechanisms by which this organism produces acute nephritis and acute rheumatic fever have not been identified, and the complexity of the organism has posed serious practical problems to those who have attempted to devise a vaccine.

Nothing is quite so humbling to the practicing physician and to the investigator as to be continually outwitted by this little bit of an organism which is so exquisitely sensitive to penicillin!

References

1. Rosenfield, A. B., and Erlanson, M.D.: Rheumatic fever survey follow-up study. Minnesota Med., 40: 102, 1957.
2. McCarty, M.: The hemolytic streptococci. *In* Dubos, Rene J. (Ed.): Bacterial and Mycotic Infections of Man. p. 248. Philadelphia: J. B. Lippincott Company, 1958.
3. Wannamaker, L. W.: The epidemiology of streptococcal infections. *In* McCarty, M. (Ed.): Streptococcal Infections. p. 157. New York: Columbia University Press, 1954.
4. Rammelkamp, C. H., Jr.: Epidemiology of streptococcal infections. *In* The Harvey Lecture Series I. p. 113. New York: Academic Press, Inc., 1957.
5. Kleinman, H.: Epidemic acute glomerulonephritis at Red Lake, Minnesota. Minnesota Med., 37:479, 1954.
6. Wannamaker, L. W.: Control of group A streptococcal infections and their sequelae. Journal-Lancet, 75:197, 1955.
7. Wannamaker, L. W.: A method for culturing beta hemolytic streptococci from the throat. American Heart Association, 44 East 23rd Street, New York 10, N. Y.
8. Committee on Prevention of Rheumatic Fever and Bacterial Endocarditis: Prevention of rheumatic fever and bacterial endocarditis through control of streptococcal infections. American Heart Association, 44 East 23rd Street, New York 10, N. Y.
9. Mathy, W. E.: Minnesota rheumatic fever survey—1958. Minnesota Med., 42:930 (July) 1959.

Special Article

The Role of Voluntary Health Associations In Meeting Future Health Needs

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Washington, D. C.

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Address presented at annual luncheon, Council on Community Service and Education, Philadelphia, October 24, 1959.

IT MEANS a great deal to me to have the opportunity of participating in this way in the annual meeting of the American Heart Association. Surely, this is one of our nation's great voluntary health agencies. There is no question in my mind at all but that you have made an outstanding contribution in helping our nation to deal in a positive manner with one of our major health problems.

First, speaking in behalf of the United States Government, I want to express to you our deep gratitude for the spirit of co-operation that has characterized all of your relations with the United States Public Health Service. I know of no finer demonstration of an effective pooling of resources on the part of public and private agencies. I am particularly happy to have the opportunity to respond to the suggestion of your program chairman that I address myself to the subject of "The Role of Voluntary Health Associations in Meeting Future Health Needs."

In my judgment, the voluntary health agencies of our nation are representative of America at its best. The agencies have come into existence because of a recognition of a need on the part of the citizens of this nation and they have moved forward with their programs because of a willingness on the part of citizens to make sacrifices in order to meet these needs. That is why I believe they represent America at its best.

I have a great admiration for the work of all of these agencies. This afternoon, however, I want to confine my comment to the role of the American Heart Association in carrying forward research, education, and community services in the field of heart disease. In doing so, I will give expression to certain hopes that I have as I think in terms of the future of your Association.

First of all, I hope that you will continue to place major emphasis on research activities.

As we all know, our nation in the past few years has increased its investment in the field of medical research at a very rapid rate. Not only has there been a sharp increase in government appropriations for this purpose but there has also been a marked increase in the amount of the funds made available for this purpose from private sources.

As many of you here know, a distinguished group of experts under the chairmanship of Dr. Stanhope Bayne-Jones recommended a little over a year ago that this country should think in terms of reaching the point where it would be investing annually a billion dollars in medical research. They also suggested that 50 per cent of these funds should come from the Federal Government and the other 50 per cent from state and local governments and private groups. Now, as you undoubtedly also appreciate, at the present time we are just slightly past the half-way mark toward this goal. It is estimated that during the year 1959 about $575 millions will be spent for medical research, on the part of government at all levels and on

the part of private groups. Furthermore, the Federal Government is assuming responsibility for about one-half of this total investment.

I believe that the goal that was suggested by Dr. Bayne-Jones and his associates is a reasonable goal. I am even more convinced that their recommendation for dividing the responsibility on a 50-50 basis between the Federal Government on the one hand and governments at other levels and private groups on the other hand is absolutely sound. I believe that if the Federal Government should assume a larger share of the total responsibility it would in the long run operate against our achieving optimum results in the medical research field.

Now, it seems to me that it is clear that if we are going to divide the responsibility for the support of medical research on a 50-50 basis, our support of medical research from private sources must move ahead at an accelerated pace. This, it seems to me, is the answer that should be given to those who ask the question: "In view of the fact that the Federal Government is spending such large sums in medical research, is it necessary for me to continue to contribute to private organizations that use a portion of their funds for the same purpose?" I feel that it is not only desirable for the citizens of our nation to continue to make contributions to private health agencies for research, but that it is imperative for them to increase their contributions if we are to keep our over-all medical research program on a solid foundation.

I think it would be a sad day for medical research, if, for example, we should ever reach the point where the Federal Government was putting up 80 to 90 per cent of the total investment in all research. We must, if at all possible, hold to this concept of a 50-50 distribution of responsibility.

In the second place, I hope that the American Heart Association will continue to place major emphasis on its program of education. I think it is absolutely impossible for anyone to really describe in an effective manner the impact of your educational program on our nation. It is certainly clear, however, that both professional and lay personnel have a far better understanding of the nature of this disease and of the steps that can be taken both to prevent it and to rehabilitate those who are its victims as a result of your program. Activities in this area, it seems to me, have complemented in a very meaningful manner the activities of public health agencies but they have been of such a nature that if you had not done what you have done, the public agencies by their very nature would have found it impossible to step in and carry forward the kind of program that you have carried forward so effectively.

I am particularly interested in the contributions that you have made in the education of professional personnel. I think that one of our most challenging opportunities in the health field is to develop educational programs that will insure the fact that our citizens will reap the benefits of research programs. The breakthroughs that take place as a result of medical research will be of little benefit unless we can devise ways and means of applying the results of the breakthroughs to the general practice of medicine. Surely you have rendered an outstanding service in this area. I hope that your activity along this line will be stepped up in the years that lie ahead.

I am confident that as time goes on the Federal Government can and will be of great help to you in the furtherance of your educational activities.

The Public Health Service's National Health Survey, for example, will soon publish its first figures on heart disease and high blood pressure. These data will come from the household interviews which constitute one major part of the health survey program. From them we can learn about medical care, about the extent to which people's usual activities are interfered with—whether they lose time from work, whether they take to their beds, and so forth.

I am told by the Public Health Service that the forthcoming report will show that an estimated 4,849,000 of the civilian non-institutional population, or 28.3 persons per thousand, believe they have heart disease. High blood pressure without a heart condition is reported for another 5,268,000 people or 31.3 persons per one thousand. About 98 per cent of these reported conditions have received medical care. The amount of disability caused by heart conditions is far greater than that resulting from high blood pressure alone. The average person with a heart condition has to restrict his normal activities for forty-nine days during the year. On the average, eighteen of these

days are spent in bed. However, the average person with high blood pressure restricts his activities for only nineteen days, including six days spent in bed.

It is clear, however, that this information, interesting and important as it is, provides only a part of the picture—the part that persons in a household can give to an interviewer. In order to round out the picture, a health examination is needed—one that will produce prevalence data and will supply, in medically acceptable terms, precise diagnosis and physiologic measurements such as blood pressure levels. Such an examination has been worked out by those who have responsibility for the National Health Survey and has been field tested, up to the present time, in three pilot projects. It is now entering gradually into the production stage. A group of these examinations is scheduled for this area, the Philadelphia area, beginning on October 29.

I am sure that as information of this kind is made available to you, that it will be possible for you to use it effectively in your own educational program. And as I think in terms of your educational program, there is one other point I would like to make. There is no question in my mind but that the educational programs of this Association and other similar associations have played a major part in developing support for governmental activities designed to deal with these major health problems. This is a point which it seems to me should never be overlooked. So for all of these reasons, I hope that you will not only continue, but that you will step up, your program in the educational area.

In the third place, I hope that community service will continue to be one of the outstanding characteristics of the work of this Association. I recognize, of course, that this activity is closely related to your educational program.

I am personally in complete agreement with the concept that the voluntary health agency, with its unique ability to involve and utilize volunteers from all levels and professions of the community, is in a very strategic position to initiate and to carry forward a type of community service that would otherwise not exist. In this connection, in order to be a little more specific, I am a great believer, for example, in the kind of service that an association of this kind at the local level can render in the whole field of rehabilitation. And the better acquainted I become with the welfare field as a whole, the more convinced I am that as a nation we must make an increasingly large investment in rehabilitation activities. The time has come for us to put more emphasis than we have on preventing some of the situations that have cost us a tremendous amount of money. That is why, for example, I am very excited over the possibilities that are inherent in our Federal-State program of vocational rehabilitation. Not only does that provide exciting possibilities, but it seems to me that the opportunities that confront an association such as this in the rehabilitation area are likewise very exciting opportunities, and I am glad to note the increasing emphasis that you are placing on this type of community service.

I personally do not agree with those who feel that the voluntary health agency should step out of the community service field and leave that field to other agencies. I recognize that these other agencies can and will continue to render a very significant service, but I believe it is a question of "both-and" and not "either-or."

Furthermore, I believe that as a society, we are capable of providing the kind of support that will make it possible for the voluntary health agencies and other agencies in the community to carry on this kind of service. After all of the agencies have done their best within the community, there will still be a great deal that remains to be done.

In my judgment, as I think in terms of your total activity—those of research, education, and community service—and as I think in terms of comparable activities on the part of other associations, our nation should not only continue to provide the support it is now providing for voluntary health agencies, but should substantially increase this support.

Now, I am not going to discuss here this afternoon the best method to follow in order to maintain and increase the support you are receiving. I recognize that this is a highly controversial area, and I recognize that there are various schools of thought when it comes to determining what methods should be followed. I'd just like to say this by way of a generalization: I am out of sympathy with the idea that in this nation we should make giving as painless as possible. If the day ever comes when we hesitate to place before our fellow citizens the needs of their fellow human beings and challenge them to make sacrifices in

order to meet those needs, that will be a sad day for our nation.

May I state just this one other suggestion or express this one other hope: I hope that if, and I believe this will take place, there is increasing support for your activity that you will not only think in terms of the service that you can render in our own nation, but that you will also think in terms of the increasing service that you can render in the field of international health. Over a period of the last sixteen months I have become increasingly impressed with the fact that our nation has an unparalleled opportunity to convey to the peoples of other nations our concern for their welfare by making increasing contributions to the strengthening of international health activity. There is a role here for the government, but there is also a role for the voluntary agencies that the government can't possibly fill. I believe that it is possible for us to carry forward as a nation a truly effective crusade for peace by helping to meet the health needs of other people, and I certainly hope that this association will continue to play an active part in the plans for the development of this crusade.

Then, may I sum up all I have been trying to say in this way: I am convinced that in carrying forward your activities you are not only helping to improve the health of the people of this nation and of other nations, but you are also helping to strengthen our spiritual foundations. You are engaged in this activity because of a conviction on your part that you have a spiritual obligation to love your neighbor or help your neighbor realize his highest potential; and your fellow citizens, as they come in contact with your work in this particular area, become aware of the fact that you recognize this spiritual obligation. I believe that as we carry on activities of this kind among the other peoples in the world they, likewise, will recognize that we recognize a spiritual obligation. The more we recognize this spiritual obligation, the more we do in the direction of putting into motion those spiritual forces that alone will provide us with a spiritual breakthrough that will ultimately lead us into a pathway of peace.

So, this afternoon, I personally would like to express my deep appreciation for the major contribution that you are making, and I know will continue to make to improve the health of the citizens of our nation and of the other nations of the world, but above all, I want to express my own appreciation for the major contribution that you are making in strengthening the spiritual foundation on which our nation rests.

THE MEASUREMENT OF SPASTICITY

(Continued from Page 21)

References

1. Hoefer, P. F. A.: Physiological mechanisms in spasticity. Brit. J. Phys. Med., 15:88, 1952.
2. Amols, W.: Clinical experience with a new muscle relaxant, Zoxazolamine; Preliminary report. J.A.M.A., 160:742, 1956.
3. Vazuka, F. A.: Comparative effects of relaxant drugs on human skeletal muscle hyperactivity. Neurology, 8:446, 1958.
4. Agate, F. J., Jr., Doshay, L. J., and Curtis, F. K.: Quantitative measurement of therapy in paralysis agitans. J.A.M.A., 160:352, 1956.
5. McKinley, J. C., and Berkwitz, N. J.: Quantitative studies on human muscle tonus: Description of methods. Arch. Neurol. Psychiat., 19:1036, 1928.
6. Smith, A. E., Martin, D. S., Garvey, P. H., and Fenn, W. O.: A dynamic method for measurement of muscle tonus in man. J. Clin. Invest., 8:597, 1930.
7. Magoun, H. W., and Rhines, R.: Spasticity. The Stretch-reflex and Extrapyramidal Systems. p. 3. Springfield, Illinois: Charles C Thomas, 1947.
8. Trancopal (WIN 4692) Brand of Chlormethazanone—Booklet for Distribution to Physicians. pp. 12, 13. New York: Winthrop Laboratories, 1958.
9. Wartenberg, R.: Pendulousness of the legs as a diagnostic test. Neurology, 1:18, 1951.
10. Boczko, M., and Mumenthaler, M.: Modified pendulousness test to assess tonus of thigh muscles in spasticity. Neurology, 8:846, 1958.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

EDITORS WANTED FOR MINNESOTA MEDICINE

This editorial is written with the thought that it may serve to locate the best available physicians for a most important project for the advancement of medical communication and science in Minnesota.

A reorganization of the method of publication of our journal is in process. The Board of Editors is seeking a number of physicians who have a desire to contribute to this enterprise. Experience in any phase of journalism, business, or related fields would be an asset. A determination to become proficient in some aspect of journalism such as the psychology of visual communications, printing, procurement of manuscripts, editing, finances, advertising, public relations, art, combined with a whole-hearted desire to contribute two or more hours a week to this effort could be most important.

If you are personally interested or know of some physician who fits the need, please contact the editor-in-chief immediately.

REHABILITATION IN MINNESOTA MOVES AHEAD

Rehabilitation has been defined as the physical, mental, social and vocational restoration of handicapped persons to the fullest usefulness of which they are capable. Adequate total rehabilitation of the handicapped citizens of Minnesota requires community effort in which physicians and ancillary workers in the health field combine with educators, educational psychologists and vocational counselors, and with men and women of good will in the community at large in developing adequate services for medical, psychologic, social and vocational guidance that will assist each handicapped person to help himself to achieve physical and vocational independence.

The Minnesota State Board of Health has developed a plan for the organization of five general rehabilitation centers in key medical institutions in the state. Three of these centers for the total rehabilitation of the handicapped already have been established, including (1) the Department of Physical Medicine and Rehabilitation in the Mayo Memorial Building at the University of Minnesota Hospital, (2) the Section of Physical Medicine and Rehabilitation at the Mayo Clinic and (3) the combined project of the Kenny Institute, Curative Workshop, and Minneapolis Rehabilitation Center group in Minneapolis. It is proposed, eventually, to establish a key center in Duluth and, finally, a center in St. Paul.

Likewise, the Board of Health has developed a rather unique program for establishing smaller satellite centers for provision of rehabilitation services in various rural communities.

Under a grant from the Federal Office of Vocational Rehabilitation, the Office of Vocational Rehabilitation in the Department of Education and the State Services for the Blind in the Department of Public Welfare are conducting a complete survey of the rehabilitation resources of the state. A complete description of these rehabilitation facilities soon will be published and distributed to all practicing physicians within the state. The State Division of Vocational Rehabilitation has undergone extensive reorganization in the past four years and, under the leadership of August W. Gehrke, Assistant Commissioner for Rehabilitation and Special Education, the facilities for vocational rehabilitation of handicapped Minnesotans has expanded to a point at which the number of persons vocationally rehabilitated has more than doubled. In 1955, a total of 582 handicapped citizens of Minnesota were rehabilitated, while during the fiscal year 1958-1959, a total of 1,173 handicapped Minnesotans were returned to new occupations through the work of the Division of Vocational Rehabilitation of the Department of Education.

A Medical Advisory Committee to the State Division of Vocational Rehabilitation (under the chairmanship of Dr. Corrin H. Hodgson, of Rochester, and the vice-chairmanship of Dr. William J. Lick, of St. Paul, who is State Medical Consultant to the Division of Vocational Rehabilitation) is accomplishing a great deal in familiarizing the physicians of this state with the importance of this joint community humanitarian effort. This committee serves also as the Com-

mittee on Rehabilitation for the Minnesota State Medical Association and is working closely with the parent Committee on Rehabilitation of the American Medical Association.

It is evident that real progress is being made in the providing of co-ordinated services for the increasing numbers of handicapped persons in Minnesota, but it is also evident that much more needs to be done in order to meet this enormous medical and social problem, in which every physician of Minnesota should be deeply interested.

In subsequent editorials, additional information concerning this magnificent effort to help the handicapped help themselves will be described. The support and understanding of all Minnesota physicians are earnestly solicited.

FRANK H. KRUSEN, M.D.

RADIATION TREATMENT OF CANCER OF THE LUNG

Surgery and radiation are the two chief methods available for the treatment of carcinoma of the lung. The first choice always lies in surgical removal if this is at all possible. Often surgery is justified not only to definitely establish the diagnosis but also to see if a reasonable chance for complete removal is possible. If, during the exploration, the lesion is found inoperable or nonresectable or if only a partial resection is done, then radiation may be indicated as a direct postoperative procedure to attempt palliation for a lesion that in a rather short time is almost certain to cause considerable morbidity. Radiation is also indicated in cases where a definite diagnosis of inoperable lung cancer has been made in some other way than by exploratory thoracotomy. There is no place for radiation treatment for carcinoma of the lung that can be removed surgically unless the patient refuses surgery or some definite surgical contraindication exists.

The results from radiation treatment of lung cancer are most discouraging, regardless of the type of radiation source (high voltage and supervoltage x-rays or cobalt radiation) or the manner in which these modalities are used. This, however, should not deter us from using this method for its palliation effect, which in many ways can be of very great comfort to a patient suffering extensively from such symptoms as bronchial obstruction, hemorrhage, intractable cough or pain. Used judiciously, the palliation can be very marked at a level well below the stage where radiation morbidity can offset its value.

Regardless of the cell type of the lesion, the records show only a very few cases where a radiation cure of a carcinoma of the lung seems proved. The more anaplastic types, such as the oat-cell and the small cell carcinomas may show a rapid early response to radiation but their quick dissemination makes it impossible to stop their inevitable advance. The epidermoid and the adenocarcinomas are quite resistive and show a rather poor response to radiation and, therefore, higher tumor dosage is necessary but usually not sufficient to arrest their extension except temporarily. However, in spite of this poor response to radiation for the possibility of a cure it is possible to make the patient much more comfortable by giving him relief from distressing symptoms. In some cases, this is done by treating, in a sense, prophylactically before these symptoms arise and to postpone their occurrence. Radiation may be withheld, especially where there has been surgical resection of some degree, until such a time as when pain or hemorrhage demand it or when breathing is showing some interference from obstruction and atelectasis. Each case needs individual evaluation and as far as possible a plan of treatment should be set up in a way that will give the greatest degree of palliation.

The indications for radiation treatment of carcinoma of the lung may be instances where tumors are operable except for their very high grade of malignancy, or where the age of the patient or some other surgical contraindication exists, and in tumors that are too close to the carina to permit excision. It is indicated in the frankly inoperable lesions where some degree of palliation can be offered. Contra-indications for radiation therapy might be a poor general condition of the patient, including fever, high pulse rate or other signs of infection or shock. Radiation to infected areas of the lung may cause rapid necrosis which can frequently be accompanied by severe and possibly fatal hemorrhage. It is usually unwise to treat through an area of tuberculosis, although at times this can be done deliberately as a calculated risk. If the tumor involves a large portion of the lung or if visceral metastases are present, radiation is not indicated. Extensive pleural effusion diffuses the radiation effect to

such a degree that proper dosage cannot be built up in the tumor area.

Palliation treatment, therefore, is the chief and almost the only reason for radiation therapy for primary carcinoma of the lung. This can be directed to the relief of pressure on large vessels and particularly the superior vena cava. Bronchial obstruction and dyspnea can be relieved by its effect on enlarged mediastinal nodes. Frequently hemorrhage of varying degrees can be temporarily stopped. Intractable cough or pain often can be markedly diminished or stopped if the lesion shows any appreciable degree of radiation sensitivity.

In planning the radiation treatment for the patient with primary carcinoma of the lung, it is necessary to keep in mind that only in the most favorable set of circumstances can one even entertain the remote possibility of a cure. Palliation treatment, however, should not be only a casual attempt, but one carefully directed to give the greatest possible degree of help with radiation morbidity kept at an acceptable level. Nothing is gained by substituting radiation complications that may be as bad or possibly worse than the disease being treated. The types of radiation used seem to have relatively little variation in the end results achieved. High voltage radiation in the range of 250 to 400 thousand volts, the supervoltage in the range of 2 million or more volts and cobalt therapy are all useful. Each may have some advantage over the others but with none is the result a satisfactory one. There is no appreciable help to be expected from nitrogen mustard and allied substances in the treatment schedule for carcinoma of the lung.

Although radiation therapy takes second place to surgery in the treatment of carcinoma of the lung in the operable, asymptomatic cases, it can join with surgery greatly improving the lot of the patient that has only a partially resectable lesion. It can take over entirely where surgery has nothing to offer by helping to alleviate the many types of suffering such patients often must undergo. Until more effective treatment methods can be found, the best improvement in results in the treatment of primary carcinoma of the lung will come from finding a greater number of localized asymptomatic lesions.

J. Richards Aurelius, M.D.

PRESCRIPTION: RECREATION

Medicine is performing miracles to extend life, and it is clear that ways must be found to make the added years not just endurable, but enjoyable and useful.

Of all the problems identified with aging, the one most common to the greatest number of senior citizens is what to do with the added leisure of retirement years. Regardless of income, the man or woman whose life has been full of the demands of a job and growing family finds that time, which should be a boon, is too often a burden. Many are wasting as much as a third of a lifetime in a "rocking chair existence."

Our changing society, with its small homes, transient and scattered families, enforced retirement and automation, provides few opportunities for the useful employment of time that the elderly enjoyed thirty years ago, and retirement often marks the beginning of a gradual withdrawal from all outside contacts.

Physicians are aware that they are sometimes called, not because an older person is actually ill, but because he has a desperate need to talk to someone, and that the serious medical and mental conditions of some are often the result of nothing more than the heartaches of loneliness and the frustration of too many empty hours.

Dr. Paul Dudley White warns that "Physical and mental inactivity, not senility, are responsible for many of the ailments of old age," and Senator Thomas C. Desmond, former chairman of the New York State Joint Legislative Committee on Problems of Aging, writes: "Pessimism probably kills more old folks than disease. I suspect that often heart trouble is caused by losing heart. Our elderly are not often vanquished; they are more likely to surrender. They are less likely to give out, than to give up."

For many people, the end of existence is almost worse than not existing at all. Forty per cent of the patients in our mental hospitals are sixty-five or over, and we have not begun to meet the need for other types of institutional care for older people. Prevention is far lass costly.

A number of studies conducted in the past few years point to recreation and social programs as one means of effective prevention. In Hennepin County, not one member of the more than fifty Golden Age Clubs has been admitted to a mental hospital. At the William Hodson Center in New York, a controlled study showed clinic attendance

reduced by 37.8 per cent in less than a year from the time members became active. Members of social and recreation groups frequently report that their physicians have been surprised at their improvement and have reduced or discontinued medication after they found companionship and new interests in activity programs.

Fortunately, the need for this type of program is readily recognized, and many communities have organized groups. Through sponsorship of these programs by recreation or social agencies, churches, civic, fraternal, educational or social organizations or independent committees, an awareness of other problems grows out of this more intimate association with older people.

Until the late forties, it had not occurred to anyone that older people might enjoy meeting together as other age groups do for companionship and fun, even though for many years programs were planned around the common interests and abilities of other age groupings, such as children seven to nine, nine to twelve, teenagers, young adults, and so on. While response to the first groups organized was far beyond expectations, and Golden Age Clubs mushroomed all over the country, some older people still resist the comparatively new concept of recreation as a necessary part of healthful living, and require a considerable amount of stimulation before they will participate.

Dr. Paul Haun, Director of Professional Education, Eastern Pennsylvania Psychiatric Institute, pinpointed one of the reasons in an address before the eleventh annual conference of the Pennsylvania Recreation Society when he said, "We have inherited a set of unspoken attitudes which have been superimposed on these simple and correct distinctions between work and play. Sin, somehow or other, became an issue. Work was virtuous rather than only proper and desirable. Play was shameful, rather than necessary and pleasant. All forms of amusement wasted time and were clearly immoral, partly because they diverted man's energies from work, but more significantly because they were enjoyable, and pleasure itself was a mortal sin." We are learning that for some, only work or a work substitute will ever be an acceptable form of recreation.

It must be remembered that this generation has known little, if any, leisure, and comparatively few group experiences; that older people are often influenced by false concepts of age, especially since they remember that their own parents were "old" at a much younger age; that their opportunities to participate in more than a few types of recreation have been limited.

We must also remember that even though aging is a "slowing down process," and we become a little impatient with the shell in which we live as we grow older, the spirit is often as young as it ever was, and as venturesome. The needs are the same as those of any other age group—the need for social relationships with other people, the need to be useful, the need to create something or to contribute something, the need to learn, the need to forget oneself in relaxing occupations, the need for recognition.

A good recreation program should meet all of these needs by offering a wide choice of activities which are stimulating both mentally and physically, including many this generation has "never had time to try," and would not ever think of trying in competition with younger people.

The interests of older adults are as broad and varied as those of any age group, and we have long since abandoned the idea that "you can't teach an old dog new tricks." Lively discussion follows lectures on physical and mental health, nutrition, family problems and other subjects of special interest to people of this age. Unexpected and neglected talents thrive under the stimulation of classes in creative crafts. Dancing, active games and mild physical exercise stimulate good circulation and appetite, a sense of well-being and a brighter outlook, and moreover are fun. Community singing, talent shows, orchestras, mental games, book reviews, movies, travelogues, fashion shows and birthday parties challenge the interest of those who in the beginning may refuse to participate in anything but card games, simply because card playing is the only kind of recreation they have known.

Volunteer service projects provide an opportunity to be useful, and at the same time utilize the experience and know-how of senior citizens to the advantage of the whole community. Among the many types of useful services needed are "friendly visitors" to the handicapped and housebound of their own age group who are unable to leave their four walls and have lost touch with the community.

Participation in recreation programs of this kind, the constructive use of leisure time, will

benefit many who are now hesitant about joining one of these groups—if the physician prescribes for healthful, more enjoyable living.

(Mrs. A. W.) Opal Tews, *Supervisor, Senior Citizens Leisure Time Activities, St. Paul Bureau of Parks and Recreation*

URINARY DIVERSION

Surgeons have searched for nearly a hundred years for a safe method of diverting the urine above the bladder. Some types are relatively safe from the viewpoint of surgical mortality, but none is free from the danger of late complications affecting the upper urinary tract. The variety of methods and techniques so far devised attest a fundamental dissatisfaction with results of all varieties of urinary diversion.

The possible indications for diverting the urine, while not very frequent in occurrence, include quite an array of diverse disorders:

1. The bladder has to be removed.
   Primary and secondary neoplasms.
2. The bladder cannot be made to function adequately.
   (a) Neurogenic vesical dysfunction.
      (1) Atonic bladder with large residual urine.
      (2) Incompetent sphincters.
   (b) Irremediable urethral strictures.
   (c) Irreparable vesical fistulae.
   (d) Serious congenital anomalies.
      (1) Exstrophy.
      (2) Complete epispadias.
      (3) Atonic bladder with congenital ureterectasis.
      (4) Obstruction at vesical neck with "paper thin" ureters.
   (e) Inoperable vesical neoplasms (for palliation).
3. To arrest renal damage from unsatisfactory ureterosigmoidostomy.
4. Severely contracted bladder.
   (a) Tuberculous or posttuberculous.
   (b) Interstitial cystitis ("Hunner" ulcer).
   (c) Postinflammatory fibrosis (nonspecific infections).

I should like to emphasize that urinary diversion is to be considered *only* when simpler or safer methods fail or are inapplicable.

An almost embarrassing array of methods is available, all having their own peculiar advantages and disadvantages. Simplest, and safest in terms of surgical mortality, are nephrostomy and ureterostomy. However, they burden the patient with catheters which must be changed and which, serving as foreign bodies, all too often lead to infection, renal lithiasis, and eventual renal failure. Therefore, pending the development of dependable methods not requiring inlying catheters, these operations are usually used only as temporary expedients, or as permanent ones in poor surgical risks with short life expectancies.

Ureterosigmoidostomy is the best method from the patient's viewpoint because it does not require the wearing of catheters or bags. However, it connects the urinary tract, intended to function in a sterile environment, with a heavily infected organ capable of generating pressures higher than those normally found in the urinary tract. All too often this leads to hydronephrosis and pyelonephritis. As these lead to impaired renal function, hyperchloremic acidosis may become a problem.

Many attempts have been made to protect kidneys which have been connected to the colon: diverting abdominal colostomy (Mauclaire); and perineal colostomy (Gersuny) are most logical, but have not been widely used. Both provide a relatively clean urinary reservoir, the latter without the disadvantages of an abdominal stoma.

Because bringing the end of the descending colon through the anal sphincter may imperil its blood supply, abolish the defecation reflex, and render the anal sphincter inoperative by overdistending it, Delev isolated a segment of sigmoid, and made an end to end anastomosis around it. He narrowed its lower end to the diameter of the urethra and brought it out between the anterior rectal wall and the anal sphincter. He closed its upper end and anastomosed the ureters to it. He has reported three successful cases.

Others have sought to prevent contamination of the kidneys by interposing a segment of ileum between ureters and sigmoid. Since ileac peristalsis is relatively feeble, being able to resist back pressures of but 7 to 25 centimeters of water (defecating pressures rise to 280 centimeters of water), this is an idea of doubtful merit.

Gilchrist and Merricks have used the isolated cecum and ascending colon as a urinary reservoir, catheterizing it through a segment of terminal ileum opening to the outside. Repeated catheterization cannot but cause damage to the urinary tract in the long run.

The latest thing (first used by Shoemaker in 1908) is diversion through an isolated segment of ileum with one end closed and the other open-

ing upon the abdomen and fitted with a collecting bag. This has been popularized in this country largely by Bricker. It is alleged that, since the ileum is a conduit rather than a reservoir, absorption of urinary constituents is negligible. This is turning out to be false in patients with seriously impaired renal function; bitter disappointments with use of the ileum in congenital ureterectasis is causing some surgeons to turn back to cutaneous ureterostomy with variations intended (with variable success) to avoid the use of catheters.

C. D. Creevy, M.D.

LAW-MEDICINE PROBLEMS: CONFLICT OR CO-OPERATION

The problems confronting the law-medicine relationship begin long before the courtroom. The adversary proceedings of a common-law trial merely illuminate these problems and ignite the participants—lawyers and doctors.

The first problem is a lack of understanding of the other profession, its purposes and its practices.

Law is man's tool to provide peace and order in a community, human dignity and human rights to each citizen of the community, and equal opportunity for physical, mental and spiritual growth to all citizens. The law replaces violence in the settlement of human conflicts and controversies. Thus the community can be at peace. The law protects individuals with fair hearings, representation by counsel, examination and cross-examination in trials to attempt to acquire truthful facts to which just laws will be applied and fair decisions thereby rendered. Lawyers are the lubricating oils which facilitate the administration of justice. Lawyers deal with a client and the community simultaneously. The client is not isolated from other men. The very fact that he is a client means he is involved legally with another man or the community. The lawyer's practice includes two sides to every legal problem, both human. The adversary procedure of common law has been the best available method to assure that both sides can present their viewpoints in the strongest manner. The decision-maker-judge, jury, referee, board or commission, must then resolve the conflict to maintain peace and order, not necessarily to please one client or the other. The lawyer practicing as a lawyer is not a decision-maker. He is counselor and adversary.

Medicine is man's tool for understanding the human body, for preventing, alleviating and curing human illnesses, diseases and injuries, and for the continuous extension of the human life-span. Medicine provides man with hospitals, clinics, laboratories, and doctors' offices in order to determine truthful medical facts to which the doctor will render an opinion and apply preventive or therapeutic measures. Doctors are lubricating oils too, but they are more. The doctor is also a decision-maker. He prescribes for his patient; the patient abides. His patient is not involved medically with another patient. The doctor need not advocate his patient's case of pneumonia against an adversary patient's pneumonia.

The doctor jousts with a germ; the lawyer with another opposing human being. The doctor's practice does not entail adversary measures against another person; the lawyer's does. Adversary procedures like trials are foreign and distasteful to doctors. His practice precludes their use and his experience denies their wisdom. To the lawyer such procedures are the best means of resolving conflicts between two people when negotiated settlement is impossible. His practice and experience make these procedures natural and acceptable. The doctor views the lawyer as one who often doesn't want medical truth because of his cross examination tactics. The lawyer views the doctor as one who places himself in the position of a god whose ideas are not to be questioned and whose facts are not to be challenged.

Obviously in our complex society today the frictions between our professions are increasing and will continue to do so. The first problem is to understand better the differences between the two professions. Through writings, addresses, joint educational experiences, both lawyers and doctors can be stimulated to appreciate the other's professional goals and practical values to society.

Given this appreciation and the desire to understand the other profession, more subtle law-medicine problems can be investigated.

An immediate challenge appears in the area of communications—the meaning of words like "cause." What "causes" a patient's ill health may be several factors. The doctor does not need to find one direct or proximate cause upon which to diagnose his case. He may even be unable to determine one "cause" in the true sense but experience will enable him to alleviate or cure. "Cause" is important but not crucial to the medical man.

The lawyer finds "cause" to be crucial. In determining whether a defendant be liable in damages to a plaintiff for personal injuries, the decision-maker must determine by the greater weight of the evidence that defendant's misdeed was the probable direct or proximate cause of plaintiff's injury or illness. Plaintiff cannot recover *legally* unless this "cause" is determined. Plaintiff can recover *medically* whether this "cause" is determined or not.

When a doctor becomes a medical expert witness, he must speak words with legal meanings not medical meanings. Even before he becomes a witness, the lawyer must explain to his doctor witness the full significance of the communications confusion.

Other problems of concern to the law-medicine relationship are the best methods for using medicine as a source of truth by which justice can be achieved. Do qualified doctors refuse to provide medical evidence? Do lawyers bar respectable medical witnesses by courtroom histrionics and innuendos? Is the doctor best able to present evidence in the capacity of an adversary witness rather than as a witness for the court subject to cross-examination by both parties? Can the doctor's evidence be in writing and better used in pre-trial conferences where opposing parties have an opportunity to settle the conflict with the judge's guidance? Will mutual exchange of all medical evidence in writing between opposing parties prior to a lawsuit stimulate negotiated settlements conserving the time of lawyers, doctors and courts? These questions demand great thought among the members of both professions. Proper answers will not only benefit the two professions but more important, society as well.

The interdependence of law and medicine is merely one segment of modern man's interdependence with his fellow man. All men yearn for the goals of law—peace and order, human rights, equal opportunities—and of medicine—understanding the body, preventing and curing man's ills, lengthening his life span. May the wisdom of our ancient intellectual disciplines not be fearful of our common problems; rather, let this wisdom be used to solve these problems.

Oliver Schroeder, Jr.

Mr. Schroeder is Professor of Law; Director, The Law-Medicine Center, Western Reserve University, Cleveland 6, Ohio.

PAINLESS HEALTH APPEALS

Can giving to health appeals really be made painless?

You will be interested in what Secretary Arthur S. Flemming of the Department of Health, Education and Welfare said about this, and other questions currently in the news, at the recent annual meeting of the American Heart Association in Philadelphia. The Secretary spoke at a luncheon of the Association's Council on Community Service and Education on the subject, "The Role of Voluntary Health Associations in Meeting Future Health Needs." (See page 44).

USE OF ILEUM IN URINARY DIVERSION

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Bibliography

1. Simon, J.: Estropia vesical (absence of the anterior walls of the bladder and pubic abdominal parietes); operation for directing the orifices of the ureters into the rectum; temporary success; subsequent death; autopsy. Lancet, 2:568, 1852.
2. Bricker, E. M.: Bladder substitution after pelvic evisceration. Surg. Clin. N. Am., 30:1511, 1950.
3. Stamey, T. A.: The pathogenesis and implications of the electrolyte balance in ureterosigmoidostomy. Surg. Gynec. & Obst., 103:736, 1956.
4. Bricker, E. M.: Substitution for the urinary bladder by the use of isolated ileal segments. Surg. Clin. of N. Am., 36:1117, 1956.
5. Creevy, C. D., and Bravick, D. D.: Complications following urinary diversion through a segment of ileum. Univ. of Minn. Med. Bull., 29:362, 1958.
6. Martin, L. S. J., Duxbury, J. H., and Leadbetter, W. F.: Uroepithelial lined small bowel as a ureteral substitute. Surg. Gynec. & Obst., 108:439, 1959.

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St. Paul 1, Minnesota

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4. Cyclopedia of Medicine and Surgery. Vol. II, Philadelphia: F. A. Davis Co., 1947.
5. Lang, L. A.: Personal communication.
6. Blackwell, et al.: Dermoid cysts of the ovary: Their clinical and pathologic significance. Am. J. Obst. & Gynec., 51:151 (Feb.) 1946.
7. Batson, Hiram W. K.: Dermoid cyst of the ovary. J. Louisiana Med. Soc., 105:32 (Jan.) 1953.
8. Wilson, James A.: Ovarian tumors in pregnancy; report of case of ruptured dermoid cyst. West. J. Surg., Obst. & Gynec., 63:389 (June) 1955.

Minnesota Blue Shield

Minnesota Blue Shield this month issued a letter informing participating doctors of medicine throughout the state that it is in the process of centralizing all services within its own organization following action by Blue Cross terminating the working agreement between the two Plans.

At the same time, Blue Shield advertisements in state newspapers advised Blue Shield subscribers that their Blue Shield coverage and benefits were unaffected by the organizational change.

The letter to the doctors from Dr. C. A. McKinlay, president of Minnesota Medical Service, Inc., announced that a Blue Shield division of Enrollment and Service had been established which has assumed responsibility for Blue Shield sales and services. Ben Stephens, Jr., for the past seven years manager of Blue Shield's claims department, was appointed director of the new division.

"Representatives of this Division," the letter continued, "will be loyal members of Blue Shield's immediate family and will concentrate exclusively on sales and service to Blue Shield subscribers and participating doctors of medicine."

Dr. McKinlay also announced Blue Shield's plan for a new and "less expensive" headquarters and that the organization had leased IBM equipment for claims payments, accounting, billing, and record-keeping.

In conclusion, Dr. McKinlay wrote: "Your Minnesota Blue Shield Plan is now free to expand its benefits over the full range of services rightfully within the realm of medical practice. It is a challenge—and an opportunity. With your confidence and support, your Blue Shield Plan can now look forward to the greatest period of achievement and progress in its twelve-year history."

* * *

Richard T. Crist, President of Minnesota Blue Cross announced today that effective immediately the organization will operate independently.

Crist explained that Minnesota Blue Shield, the medical-surgical plan for which Blue Cross had been performing administrative and sales functions since the plan (Blue Shield) was organized in 1947, has expressed a desire to set up their own sales force.

Crist said that Blue Cross has been of the opinion that a single sales force could service both organizations more efficiently and economically . . . "and to the best interest of all Blue Cross and Blue Shield members."

"Though this difference in opinion has led to the setting up of two separate organizations, Blue Cross will continue to handle necessary administrative functions as long as they are vital to providing the best possible service to all members or until such time when Blue Shield is staffed and equipped to operate on its own," Crist said.

Crist pointed out that the announcement will in no way affect present rates or benefits.

* * *

Minnesota Blue Shield now has available an ample supply of the new medical service report forms for distribution to physicians. A new form was developed to facilitate reporting of diagnostic x-rays and diagnostic laboratory services under the diagnostic program recently inaugurated by Blue Shield.

These medical service reports should assist physicians and their office personnel in reporting diagnostic services as well as the other services covered by Blue Shield contracts. If properly completed the claims forms will also facilitate Blue Shield processing, particularly with respect to diagnostic x-rays and diagnostic laboratory services.

The new program permits allowances only for those diagnostic x-rays and diagnostic laboratory services which are necessary to the diagnosis or treatment of a sickness or injury. Therefore, the physical signs or symptoms will often be the basis for Blue Shield payment and, consequently, information regarding the physical signs or symptoms will be as necessary to prompt claims handling as will information regarding the final diagnosis. Adequate information on all medical service reports and particularly those involving diagnostic services will eliminate many inquiries to physicians' offices which are burdensome to doctors, their office personnel, and Blue Shield.

The medical service report includes one other significant change in the form of an addition. This pertains to the new Senior Citizen Plan and involves the net worth factor which partially determines eligibility for unlimited subscriber benefits. The senior citizen subscriber is responsible for furnishing this information and, in fact, for completing the upper portion of the medical service report form if the doctor's office desires. In the case of any patient sixty-five years of age or older who is enrolled under a senior citizen contract, it would be of value in processing such claims if information regarding the income status and the net worth were included upon the report at its original submission.



Clarence Jacobson, M.D.

President, Minnesota State Medical Association

President's Letter

THIS IS MEDICINE—1960

Greetings:

The honor of being chosen to represent you as your President for this year culminates many years of happy associations with the practicing physicians of this state.

A constant desire to improve our standard of practice, to gain the confidence of the public we serve in the cause of rendering the best service to the greatest number, dominates our conferences and medical meetings.

Problems are ever present. The beginning of a New Year gives one hope for better solutions to these perplexing situations which are carried over from the old.

New challenges appear on the socio-economic horizon. Our colleagues in the old world were unable, and probably unwilling, to face the facts of economic change. They chose to remain aloof, and consequently were left without a voice to encourage better medical care when the need became manifest.

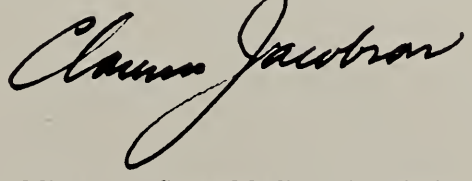
Our willingness to seek out our representatives in government, locally, state, and nationwide in an attempt to work out wise legislation is evident. The doctor has, as a result, been permitted to work in a climate of freedom which is essential to better standards of practice.

Responsibilities in a free economy demand self-control and vigilance. Our available voluntary prepaid insurance services are meeting most of the medical needs in our State. Rising costs brought about by inflationary forces are rapidly challenging our voluntary system. To circumvent them, we need to strengthen our voluntary system by avoiding internal dissension and encouraging responsibility through better communication between all our voluntary health insurance agencies. Our strength lies within our county societies who are on the active front. Through their chosen representatives to the state associations, we are demonstrating our willingness to meet and bring to effective solution many of these perplexing problems to the best interest of our patients.

We face a year of changes and possible economic upheavals which we can, and must, face together through our well-informed and well-equipped medical organizations. The Forand Bill continues to be our immediate concern. Members of Congress must be contacted by us and our friends and made to understand that we are aware of the unsound and unfair features of this social legislation. We are also aware that it leads us directly to an all-out nationalized medical program. Through our voluntary insurance agencies, we are making progress in providing care for the aged in our state. Through united efforts more can be provided. This is our only effective weapon against unsound federal legislation.

It shall be my humble endeavor to merit the confidence so generously given me to fulfill the duties of this important office, and to be guided by the fine example and counsel of my predecessors.

May the New Year bring you and your families happiness and joy.



President, Minnesota State Medical Association

Public Health

NEW PROFESSIONAL NURSING REGULATIONS EXPLAINED

The Minnesota Board of Nursing has published a second notice regarding changes in the laws regulating the practice of professional nursing in Minnesota. All physicians in the state and their office nursing personnel are advised to acquaint themselves with the changes included in the law recently enacted by the Minnesota State Legislature.

The new law provides that after July 1, 1960, only persons having a Minnesota registered nursing license in good standing, or persons who are granted permits pending completion of application for licensure by examination or interstate endorsement are eligible to practice professional nursing for hire in Minnesota.

This does not prohibit the practice of non-professional nursing, usually the sphere of nurse aides, practical nurses or attendants. While there are overlapping functions shared by all persons serving in the nursing field, the higher range of nursing functions and responsibility shall be assigned to and assumed by Minnesota registered nurses only after that date.

As of October, 1959, licenses as registered nurses by waiver have been issued to 186 persons who have met the four regulations listed below.

The regulations are (1) Evidence of good moral character; (2) Evidence of good physical and mental health; (3) Record of at least two years of satisfactory professional nursing employment in Minnesota, and (4) Record of completion of an accredited basic professional nursing education program (accredited by a U. S. or Canadian Board of Nursing during the time the applicant was a student).

The completed application provides for references from registered nurses and official statement of the school of nursing to corroborate the applicant's statement. No written examination is required if the above four requirements are satisfactorily met.

A broader interpretation of the last paragraph of the waiver section of the law will make it possible for additional numbers of persons to be considered as applicants for this licensure during the remaining months of the waiver provisions of the law.

The new interpretation states that nurses who can provide satisfactory evidence of the first three requirements listed above, but who have not completed an accredited basic professional nursing education program (number 4 above) may also apply for this licensure. To these the Board will give a written examination to satisfy itself of their qualifications for registered nurse licensure by waiver.

MORE POLIO VACCINATION NEEDED

About 87 million Americans have now had at least one shot of polio vaccine, and 68 million have had three or more injections, according to new estimates by the Public Health Service.

The figures were released during a day-long meeting Friday of representatives of health and medical organizations who were called here by the Public Health Service to review the 1959 polio experience and to map out ways of promoting further vaccinations before next summer.

Among persons under forty, over 34 million, or almost 30 per cent, have had no vaccine. Among children under five years of age, the group that accounted for 43 per cent of the paralytic cases this year, 4½ million have had no vaccine.

Data from a survey conducted for the Public Health Service by the Bureau of the Census in September, supplemented with data from the National Foundation, form the basis for the new estimates. They indicate that about 14.6 million more people have had some vaccine, and 13.2 million more people have had the recommended dosage of three or more shots since the fall of 1958 when comparable estimates were made.

Plans for a new advertising campaign to be conducted by the Advertising Council and sponsored by the Public Health Service, American Medical Association, and National Foundation were also announced at the meeting. The campaign will be launched in the early spring to support local vaccination drives.

(Continued on Page 62)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

PRIVATE MEDICINE AND VOLUNTARY INSURANCE ARE ANSWER TO FORAND BILL

"Uncle Sam With a Stethoscope" was the title of a recent address presented by Dr. Louis M. Orr, President of the American Medical Association, at the 68th Annual Meeting of the Association of Life Insurance Medical Directors of America held at the Hotel Statler Hilton, New York City, October 22, 1959. The following are excerpts from Doctor Orr's address.

"Most of you know, I am sure, that the Forand Bill—which was first introduced in 1957—is being considered by the 86th Congress. This legislation would provide certain hospital, surgical, nursing home and dental benefits to persons receiving Social Security retirement and survivorship payments. The same idea, with numerous variations in benefits and eligibility, will be appearing in many other bills and amendments."

Forand Legislation Involves Basic Principle

"The real issue is not the specific provisions of the Forand Bill, but rather the basic principle involved. Any Forand-type legislation would raise the same danger. It would add service benefits to a Social Security program which so far has been limited to cash payments based on the 'floor-of-protection' concept.

"This new principle, as you know, would alter the nature of the Social Security program. It would pave the way for evolution of a system of tax-paid health care for the entire population. Every two years—in the even years of federal elections—the push for amendment and expansion would be under way. The continuing trend would first undermine, and eventually destroy, our system of voluntary health insurance and the private practice of medicine."

Dangers of Political Appeal Explained

"No action was taken on the Forand proposal during the first session of the 86th Congress. However, it will carry over into the second session. And next year may be a different story. Because of its political appeal, this issue may very well assume 'top priority' status in the presidential election year of 1960.

"From the defensive standpoint, we must be alert to the strategy and tactics which probably will be employed next year by backers of the Forand Bill. For example, we should keep in mind these possibilities:

"They will be ready to accept compromises that will water down the bill.

"They are chiefly interested in establishing a precedent, no matter how small, for government-financed health care of the aged.

"By using the tactics of 'divide and conquer', they will try to prevent the American Medical Association from establishing a united front with the insurance industry, the Blue Plans and the American Hospital Association.

"To disarm physicians, and lessen the intensity of their opposition, the bill may be amended to cover only hospital and nursing home care.

"Every effort will be made to dilute the plan so as to make it more palatable to the hospitals. This strategy may include the suggestion that Blue Cross serve as the fiscal agent for any Social Security hospitalization plan.

"To disarm those who are concerned over the potential cost of the Forand Bill, the age of eligibility may be raised to seventy as a starter."

Beware a "Diluted" Forand Bill

"This different approach will be more dangerous than any outright attempt to pass the Forand Bill as it now stands. A compromise proposal would appear to be harmless and would not open the gate quite so wide right at the start, but it would lead to the same eventualities.

"To counter this approach, we must establish and maintain a united front of physicians, hospitals, insurance companies, Blue Cross, Blue Shield, and all other groups that would be affected by such legislation. It is especially important for hospital administrators and trustees to realize that any kind of government subsidy—either direct from Washington or indirect through a fiscal agent—would simply be the first step toward federal controls."

Medicine and Insurance Industry Solution Necessary

"However, we must do much more than just organize a good defense. We have to show that medicine and insurance have a better answer than the kind offered by Forand-type legislation. Our objective is not simply to beat an undesirable bill in Congress. Our major goal is to help solve a problem. And this particular problem gives us an opportunity for practical action—a challenge to produce dramatic progress in the growth and development of health insurance coverage for older people."

Progress to Date Noted

"Of course, definite progress already had been made before Mr. Forand emerged on the scene with his version of an old idea. As of 1958, some 43 per cent of the people over sixty-five had some form of health insurance protection. Many encouraging activities and trends have been taking shape during the past few years.

"For example, the number of persons over sixty-five

covered by voluntary health insurance has been increasing at a greater rate than the total number of persons reaching age sixty-five.

"Coverage for persons now over sixty-five has been more widely available than generally recognized, but until recently it has not been 'pushed' hard enough by most insurance companies and prepayment plans.

"Continuation after retirement of coverage carried during working years is extending rapidly.

"The principle of paid-up policies at sixty-five is still in the experimental stage, but despite the problems there are several possible ways in which this might be accomplished.

"For the past year or more, both the Blue Shield Plans and the Health Insurance Association of America have had special committees actively studying means of expanding coverage for older persons. The latter organization, as most of you know, has been urging member companies to offer policies that are guaranteed renewable for life, individual and family coverage for persons already over sixty-five, group coverage that will continue after retirement, and group contracts providing the right to convert to individual coverage when employment is terminated."

AMA Takes Action

"To help stimulate all these developments, the House of Delegates of the American Medical Association last December (1958) adopted a proposal which applies specifically to the population group over sixty-five with very modest resources or low family income. For medical services rendered to this particular group, physicians are urged to accept a level of compensation that will permit the development of insurance and prepayment plans at a reduced premium rate.

"Needless to say, the AMA is urging all state and county medical societies to implement that policy of adjusted fees with the utmost speed and vigor. And early this year the Blue Shield Plans developed a model insurance contract for persons over sixty-five, incorporating the principle of the AMA policy action.

"By August, when we testified before the Senate Sub-Committee on Problems of the Aged and Aging, we were able to report that twenty-five Blue Shield plans in twenty-three states now enroll persons over sixty-five. In practically all of the other states, medical societies and Blue Shield plans are working out special new programs for the aged. It also was reported that all Blue Shield plans now permit those over sixty-five to continue their coverage."

Insurance Industry Co-operates

In addition, the commercial insurance companies have been making excellent progress during the past year. An increasing number of companies—including many of you represented here today—either have announced new, specially tailored policies for the aged, or you have extended existing policies to more and more states.

"We can say with truth and confidence that health insurance coverage for the aged will grow at an accelerated pace in the months ahead. In a conservative estimate based on trends of the recent past, the Health Insurance Association of America predicted earlier this year that sixty per cent of the senior citizens who want it or need it will have protection by the end of 1960. Their further estimates are 75 per cent by 1965 and 90 per cent by 1970. Actually, however, because of the intense interest and activity now centering on this problem, the rate of growth might far exceed those conservative predictions—if medicine and insurance will co-operate in a valiant, all-out effort."

Development of Voluntary Coverage for the Aged Is Vital

"During the next nine months or so many people, including the members of Congress, will be paying close attention to the over-all problems of aging and the aged. And while health insurance coverage for older people is only one phase of this broad subject, it is—from a timely, practical standpoint—the most urgent field of activity.

"In my opinion, the medical profession, the prepayment plans and the insurance companies must concentrate in the months ahead on the development of voluntary coverage for the aged. We must promote, advertise and publicize new plans and policies. And we must be able to go before the Congressional committee hearings next spring with a real story to tell—a story of dramatic growth in coverage, new ideas and approaches, and hopeful outlook for future progress.

"If we make that kind of effort, and if we can present a convincing case to Congress next year, I think we may be able to beat back the advocates of government action. If we do not make that effort, I would hesitate to predict the long-range future of medicine and voluntary health insurance."

U. S. CHAMBER OF COMMERCE TAKES ACTION TO OPPOSE FORAND BILL

The Chamber of Commerce of the United States is among the national organizations allied with the American Medical Association, the American Hospital Association, the American Dental Association, the American Nursing Home Association and Blue Cross and Blue Shield in opposing the Forand Bill.

The Insurance Committee of the Chamber of Commerce at its September 17 meeting approved recommendations from its Advisory Committee on Health Insurance for action to strengthen business leadership in combating continuing pressures for compulsory health insurance programs.

The report of the Chairman of the Insurance Committee points out that the proponents of a system of national compulsory health insurance are now concentrating their efforts in two areas. One

involves a plan to amend the social security law so as to give hospital, surgical and nursing home care to our older people, specifically those who are eligible for old-age and survivor benefits. Their plan is set forth in the Forand Bill (H.R. 4700) which is before the Ways and Means Committee. Hearings were held last July and it appears certain that a major effort will be made to pass it next year. The Chamber has opposed this bill.

According to the report, the other major effort of compulsory health insurance advocates is directed toward domination of the White House Conference on Aging, to be held in January, 1961. Already it is apparent that this conference will be made the base for a drive for further government benefits of various kinds for the older people.

The report states that prior to the 1961 White House Conference the law calls for conferences to be held in each state to formulate recommendations to the national conference. Activity is now going on in the states and it appears that the final outcome will be quite well determined at the state and local levels well in advance of 1961.

The advocates of a national system of compulsory health insurance, including the labor unions, welfare workers and others, are working to gain control of these state conferences and their planning committees. Their aim is to get recommendations to the White House Conference favoring compulsory health insurance. Recommendations by the White House Conference favoring a compulsory system would become a powerful influence on Congress to enact such legislation.

The principle, pertinent policy of the Chamber of Commerce of the United States regarding compulsory medical and hospital insurance states:

"The ability of voluntary health insurance to bring a satisfactory measure of protection to practically all the American people is demonstrated in its rapid expansion, wide public acceptance, free competition, experimentation leading to improvements in quality of coverage and method, and progress in insuring aged and impaired persons. Development to its full capacity should be encouraged, but not by payment of a subsidy.

"Proposals for compulsory medical and hospital insurance (socialized medicine) are opposed because their adoption would lower the high standards of medical care in the United States."

The American Medical Association has urged state and county medical societies to co-operate with the Chamber of Commerce in their efforts to oppose compulsory health insurance.

MINNESOTAN URGES PHYSICIAN INSTRUCTION IN PRINCIPLES OF HEALTH INSURANCE

Dr. Haddon M. Carryer, Chairman of the House of Delegates of the Minnesota State Medical Association, recently urged medical schools and medical societies to undertake regular instruction of doctors and students in the use and principles of health insurance.

Doctor Carryer, of the Section of Medicine of the Mayo Clinic, made the suggestion in commenting on the "many problems in common" of the medical profession and the health insurance business.

He addressed the annual Individual Insurance Forum of the Health Insurance Association of America at the Biltmore Hotel in New York City.

Pointing to "The current efforts on the part of both the medical and insurance profession to extend the usefulness of health insurance," Doctor Carryer reported on major common problems toward achieving this goal, and declared:

"These problems are magnified because we are constantly beset by outside planners who would discard gradual evolutionary processes and take a far more radical tack into plans not best for the people whether they be patients or policyholders."

Among problems listed by Doctor Carryer were the costs of processing large numbers of claims, the "failure by patients to understand the nature of the insurance and of benefits to which they are entitled," and not fully understood features of some of the newest types of policies.

"Another problem concerns the matter of indoctrination of physicians with respect to insurance matters," he told the audience of insurance executives. "Instruction should be started in the medical schools with a series of lectures. It should extend to the county medical society and state medical society levels so that physicians understand clearly the significance of such terms as insurance, comprehensive insurance, catastrophic insurance, corridors, deductibles and coinsurance.

"When an insurance program, especially one involving comprehensive care, is introduced in the community, a review of the insurance principles involved should be an integral part of that introduction.

"The omission of such an indoctrination only leads to misunderstanding, over-utilization and bad public relations—bad both for the insurance company and for the physician who may not thoroughly understand insurance principles."

Doctor Carryer praised "the remarkable job that the insurance industry is doing to extend coverage and to make it meaningful to the American people," adding:

"When one considers that this growth is mainly of only fifteen years duration and that now 125 million people have some type of sickness coverage, one can only be amazed at the job that has been accomplished."

EXPERTS PREDICT RISE IN HOSPITAL COSTS; DOCTORS' BILLS WILL HOLD STEADY

The next few years will see hospital costs soaring, doctors' fees holding steady, and medical insurance growing until nearly all the general population is covered for every kind of illness and accident. These predictions, based on extensive interviews with U. S. health officials and physicians, were made recently by *Life* magazine in the concluding article of a series on the American doctor.

The magazine said that it is probably impossible to reduce the costs of running a hospital, but that experts who have studied the problem of skyrocketing prices for hospital care are searching out new paths to efficiency.

In the twenty years from 1936 to 1956 the fees charged by surgeons rose by sixty per cent, those of general practitioners seventy-three per cent. Neither are considered out of line with general price rises. But during the same period, hospital room rates zoomed 265 per cent, faster than almost anything else the dollar can buy. In most hospitals today, private rooms cost about $25 a day.

The *Life* study showed that hospital costs will continue to rise as the result of being forced, among other things, to pay employes better wages. The magazine pointed out that hospitals traditionally have been among the most relentless exploiters of unskilled labor, paying anywhere from $10 to $20 a week less than industry. A hospital strike in New York last spring uncovered the fact that many hospitals were paying their unskilled help weekly salaries of $33.

Two other reasons for bigger bills are the demands by patients for fancier, better decorated rooms, and the fact that nursing care, laboratory and other technical services, which used to take less than half the hospital dollar, today gobble up almost three-fourths of that dollar as new techniques and discoveries enlarge the opportunities for proper medical treatment.

Physician fees will probably remain steady, the magazine said. Thanks to a prosperous economy and the various insurance plans, the hospitals now collect more than 90 per cent of their bills, whereas once they were lucky to collect 75 per cent.

MORE POLIO VACCINATION NEEDED

(Continued from Page 58)

An analysis of the 1959 polio experience made by the Communicable Disease Center of the Public Health Service and reported at the meeting, showed that the vaccine had proved to be at least 90 per cent effective this year in protecting persons who had had three or more doses. In the three cities where major epidemics occurred this year—Des Moines, Iowa, Kansas City, Missouri, and Little Rock, Arkansas—cases were concentrated among unvaccinated persons living in crowded, lower economic areas. A similar pattern occurred in most of the fourteen other cities that reported moderate outbreaks.

After reviewing these and other data, the conference concluded that communities need to start immediately to plan intensive campaigns including surveys to find the neighborhoods where most of the unvaccinated live. They urged that special emphasis be placed on giving vaccinations to infants and preschool children, only 53 per cent of whom have as yet had the recommended schedule of three or more injections. They also urged that all persons who had their third injection a year or more ago get a fourth injection before next summer.

WEAPONS AGAINST TUBERCULOSIS

Early diagnosis.—With the tuberculin test, modern chest x-rays and laboratory tests, unsuspected cases of tuberculosis can be discovered.

Treatment.—Hospitalization until the patient is no longer infectious is usually necessary. The most widely used drugs are isoniazid, streptomycin, and PAS. Sometimes surgery is necessary, too.

Rehabilitation.—Experts help patients to accept and continue treatment until cured; to resume normal, productive living; and to avoid relapse.

Education.—Teaching good health habits to everybody raises the general level of health and so helps increase resistance to tuberculosis.

Research.—Scientists' efforts to find better ways to prevent and cure tuberculosis continue in investigations of immunity, resistance, the nature of the tuberculosis bacillus.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

PROFILE OF AN OFFICE ANGEL

Modern diagnostic techniques and equipment have failed to analyze the true success characteristic of the "office angel." *The Bulletin* of the Academy of Medicine of Cleveland recently introduced an article "How to Be the Office Angel" with the following provocative questions.

Is it a pretty face? A sweet voice? Good taste in clothing? Speed at typing?

The article acknowledged that each of these traits is important, but almost any major business executive (and physician) can tell you that none of these is the most important. Some "office angels" lack one or another of these traits. A few lack them all! But in key areas, heavenly secretaries—and their halos—really shine.

1. *Keeping Secrets.*—Sometimes, it's not easy to chat with friends and co-workers without discussing the job, but the best secretaries can do this without revealing any business confidences. The higher a girl rises in position, the more she's apt to know about the business and her boss and the more important her discretion becomes.

2. *Forgiveness.*—To forgive is divine, the saying goes, and the office angel knows it! Sooner or later, a boss is bound to criticize unfairly. The office pest isn't unpleasant out of choice; he doesn't know any better. Strong complaining may make a girl feel good—especially when she knows she's right, but the office angel tries never to build up her ego in this way.

3. *Taking Messages.*—However bright she may be, the ideal secretary never trusts to memory in relaying messages. Instead, she writes the information down; she's too busy to store names and numbers in her mind unnecessarily.

4. *Clock-watching.*—The office angel *is* a clock-watcher; to her, the clock is a useful office tool. It lets her know when a job is taking too long, or, if surprisingly little time has elapsed, it tips her off that she may have forgotten something. She's a calendar-watcher too—keeps a handy little office diary on which to record, among other things, birthdays, anniversaries and such.

5. *Psychology.*—Everyone likes to have his ideas considered, and accepted if possible. So the office angel listens to advice, then takes all the good advice she can (even when offered in the form of a complaint). Even if she was planning to do the thing anyway, she is generous enough to flatter the person by letting him think it was his idea. Why not?

6. *Better Methods.*—The office angel is lazy, but in a very special way. Will a better typewriter ribbon save her work? She'll ask for one as soon as she spots the need. Would she have more time to assist her boss if he'd switch to a dictating machine? She'll suggest the idea, and back up her suggestion with time records kept for two weeks or a month.

7. *Punctuality.*—Nearly everyone in the office comes in and leaves on time, but being punctual means more than this. It means no dragged-out lunch periods, or coffee breaks, or time lapses between different jobs in the office. Spell it "punctuality" or "dependability," the office angel works without having to be watched.

8. *Hope.*—The office angel hopes—and works—not only for her own advancement, but for that of her boss and her company as well. It's an old rule, as true today as ever, that he who gives the most gets the most.

9. *Faith.*—Confidence in the future is a prime characteristic of the office angel. Tactful and skilled in office procedures, she has no cause to worry about her job. If her boss wants to buy a dictaphone dictating machine, she's for it; it's her productivity, not her stenographic skill, she knows, that makes her secure in her job.

10. *Charity.*—Just as rich people give to those less fortunate, the gal who is rich in skills and know-how does what she can to help those who are less experienced or less intelligent. The angel puts in that extra fifteen minutes, now and then, so that a friend may meet her date on time. By watching out for the feelings of others, never lording it over them, helping out—within reason—wherever she can, the office angel stores up treasures in heaven . . . and right here on earth, besides!

Our hats are off to the office angel.

PRESCRIPTION FOR IMPROVING DOCTOR-PATIENT RELATIONSHIP

Members of state and county medical societies who are interested in promoting ideas in improving the relationship between doctor and patient will want to read these remarks by Doctor Paul H. Sullivan, former president, Nassau County Medical Society. They appeared in the organization's *Nassau Medical News.*

If we are to hold to the principle that a patient is entitled to his own physician we must make sure that this actually brings him better medical care than he would get through the "assembly line" methods of group practice, or the service of a "closed panel" hired and paid by someone else.

Our code of ethics provides that "a doctor of medicine is free to choose whom he will serve" but it also states that "he shall not neglect the patient." The personal physician will of course get to know his patient as an individual, but he should also remember the following:

1. Keep your practice covered at all times. If you are planning to be away, make sure some specific person will take your calls. Do not depend upon "service" to find "somebody" to cover your night calls or emergencies. If you are "his" doctor, your patient will expect you to take care of him.
2. Find out whether your patient is insured, and if so, the precise nature of his insurance and how much help he can expect from it.
3. Discuss with him in advance your fee and other financial details such as laboratory services, consultants, *et cetera.* Make sure he understands so that no disputes can arise later.
4. If your patient is covered by a "service benefit" policy approved by the society, he should be given the service. If his policy is for indemnity benefits, you are entitled to set your own fee, but you should avoid "upping" it just because of the insurance. Remember that your patient has been paying premiums for his insurance so he can be protected when the need arises. If insurance is used only as an excuse for higher fees, the whole system of voluntary insurance will break down—and with it perhaps the whole system of "free choice" and "personal physician."
5. If the patient thinks of you as "my doctor," he expects you to think of him as "my patient."

PUBLIC HEALTH EDUCATION COMMITTEE LENDS A HAND

Listener mail response to the WCCO radio shows and the "Doctor, Tell Me" series has been very heavy.

A number of the letters are simple requests for a radio discussion of a particular health topic. Others are diagnostic in their nature and require professional treatment.

Since February, the Public Health Education Committee has included answering these letters as an important phase of their committee function. The quantity of letters which require special attention will often total forty to fifty in number per week.

Medical Legal Opinion

The purpose of this section entitled Medical Legal Opinion is to publish news of recent litigation concerning medical practice as well as to cite past actions and opinions of the Court in medical legal matters as a means of refreshing our knowledge of such procedures.

Minnesota Laws on Practice of Medicine

DEFINITION—PRACTICE OF HEALING—MINNESOTA BASIC SCIENCE LAW

Wherever the term "practicing healing" or "practice of healing" is used in this chapter, unless otherwise specifically defined, the same shall be understood and construed to mean and include any person not hereinafter excepted from the provisions of this chapter, who shall in any manner for any fee, gift, compensation, or reward, or in expectation thereof, engage in, or hold himself out to the public as being engaged in, the practice of medicine or surgery, the practice of osteopathy, the practice of chiropractic, the practice of any legalized method of healing, or the diagnosis, analysis, treatment, correction, or cure of any disease, injury, defect, deformity, infirmity, ailment, or affliction of human beings, or any condition or conditions incident to pregnancy or childbirth, or examination into the fact, condition, or cause of human health or disease, or who shall, for any fee, gift, compensation, or reward, or in expectation thereof, suggest, recommend, or prescribe any medicine or any form of treatment, correction, or cure thereof; also any person, or persons, not hereinafter excepted from the provisions of this chapter, individually or collectively, who maintains an office for the reception, examination, diagnosis, or treatment of any person for any disease, injury, defect, deformity, or infirmity of body or mind, or who attaches the title of doctor, physician, surgeon, specialist, M.D., M.B., D.O., D.C., or any other word, abbreviation, or title to his name indicating, or designed to indicate, that he is engaged in the practice of healing.

(Section 146.01—Minnesota Statutes 1957)

A violation of the Minnesota Basic Science Law is a gross misdemeanor and punishable by a fine of not to exceed $1,000 or not to exceed one year in jail.

(Section 146.17—Minnesota Statutes 1957)

DEFINITION—PRACTICE OF MEDICINE—MINNESOTA MEDICAL PRACTICE ACT

Every person not heretofore authorized by law so to do who shall practice medicine in the state without having obtained the license herein provided for, and every person who shall so practice contrary to any provision of this chapter, shall be guilty of a gross misdemeanor. Any person shall be regarded as practicing within the meaning of this chapter who shall append the letters M.B. or M.D. to his name, or for a fee prescribe, direct or recommend for the use of any person, any drug, or medicine or other agency for the treatment or relief of any wound, fracture, or bodily injury, infirmity, or disease.

(Section 147.10—Minnesota Statutes 1957)

Splitting Fees Unlawful.—It shall be unlawful for any physician or surgeon to divide fees with, or to promise to pay a part of his fee to, or pay a commission to, any other physician or surgeon or person who calls him in consultation or sends patients to him for treatment or operation.

(Section 147.11—Minnesota Statutes 1957)

Punishment for Violation.—Any physician or surgeon who pays or receives any money prohibited by section 147.11 shall be punished by a fine of not to exceed $100 or by imprisonment in the county jail for not to exceed ninety days.

(Section 147.12—Minnesota Statutes 1957)

Revocation of License.—In case a physician or surgeon shall be convicted of violating any of the provisions of section 147.11, the state board of medical examiners, upon a first conviction, may, and, upon a subsequent conviction, shall, revoke the license of the person so convicted, but such revocation shall be subject to the right of the person whose license has been so revoked to appeal to the district court of the proper county on questions of law and fact.

(Section 147.13—Minnesota Statutes 1957)

INTERPRETATION OF STATUTES—DEFINITIONS OF WORDS AND PHRASES

Person.—"Person" may extend and be applied to bodies politic and corporate, and to partnerships and other unincorporated associations.

(Section 645.44, Subd. 7—Minnesota Statutes 1957)

DEFINITION—NON-PROFIT HOSPITAL SERVICE PLAN CORPORATIONS

(Blue Cross Law—Minnesota.)

Non-profit Hospital Service Plan Corporations.—Any corporation organized under the laws of this state, on a strictly non-profit basis, for the purpose of establishing and operating a non-profit hospital service plan whereby hospital service is provided by hospitals with which such corporation has a contract, to persons who become subscribers to the plan under a contract with such corporation for such hospital service shall be subject to, and, governed by the provisions of sections 309.10 to 309.17 and shall not be subject to the laws of this state relating to insurance and insurance companies, except as hereinafter specifically provided.

(Section 309.10—Minnesota Statutes 1957)

May Provide Service in Non-member Hospitals.—The hospital service plan operated by such corporation, may also provide for hospital service to such subscribers in other than contracting hospitals, in case of emergency or expediency, and subject to the approval of the governing body of such hospital service plan corporation.

(Section 309.11—Minnesota Statutes 1957)

Not to Engage in Medical Practice.—Nothing herein shall authorize any person, association, or corporation to engage, in any manner, in the practice of healing, or the practice of medicine, as defined by law.

(Section 309.17—Minnesota Statutes 1957)

DEFINITION—VOLUNTARY NONPROFIT MEDICAL SERVICE PLAN CORPORATIONS

(Blue Shield Law—Minnesota.)

Purpose.—It is the purpose and intent of this chapter, and the policy of the Legislature, to make possible a wider and more timely availability of medical care, thereby advancing the public health and the science and art of medicine in this state.

(Section 159.01—Minnesota Statutes 1957)

Incorporation and Organization.—Nonprofit medical service plan corporations hereinafter incorporated may be organized under and in accordance with the provisions of this chapter by not less than twenty-one persons, all of whom shall be legal residents of this state and duly licensed and registered doctors of medicine under the laws of this state.

Such nonprofit medical service plan corporation shall have the right to establish, maintain, and operate a voluntary nonprofit medical service plan, whereby the services of duly licensed and registered doctors of medicine and dentistry are provided in the manner hereinafter specified at the expense of such corporation to persons who become subscribers to said plan under contracts which entitle such subscribers to specified medical, surgical and dental care, appliances and supplies, by such duly licensed and registered doctors of medicine and dentistry. Such medical, surgical and dental care, appliances and supplies may be provided in their entirety or in part as such corporation may determine and as set forth in such contracts. The term "subscribers" shall include all persons covered under such contracts.

All such nonprofit medical service plan corporations shall be subject to and governed by the provisions of this chapter, and shall not be subject to the laws of this state relating to insurance and insurance companies, except as hereinafter specifically provided.

No such medical service contract by or on behalf of any such nonprofit medical service plan corporation shall provide for the payment of any cash indemnification by the corporation to the subscriber or his estate on account of death, illness or other injury.

(Section 159.02—Minnesota Statutes 1957)

DEFINITIONS—HOSPITALS—HOSPITALIZATION—MINNESOTA

Hospitals, Licenses, Definitions.—No person, partnership, association, or corporation, nor any state, county, or local governmental units, nor any division, department, board, or agency thereof, shall establish, conduct, or maintain in the state any hospital, sanatorium, rest home, nursing home, boarding home, or other institution for the hospitalization or care of human beings without first obtaining a license therefor in the manner hereinafter provided.

Hospital, sanatorium, rest home, nursing home, boarding home, and other related institutions, within the meaning of sections 144.50 to 144.56 shall mean any institution, place, building, or agency in which any accommodation is maintained, furnished, or offered for the hospitalization of the sick or injured or for maternity care of more than one woman within a period of six months or for care of three or more aged or infirm persons requiring or receiving chronic or convalescent care. Nothing in sections 144.50 to 144.56 shall apply to hotels or other similar places that furnish only board and room, or either, to their guests.

"Hospitalization" means the reception and care of persons for a continuous period longer than twenty-four hours, for the purpose of diagnosis or treatment bearing on the physical or mental health of such persons.

"Maternity care" means the care and treatment of a woman during pregnancy or during delivery or within ten days after delivery, and for the purposes of sections 144.50 to 144.56 shall include

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AMA Report Discloses Status of Medical Education

The Council on Medical Education and Hospitals of the American Medical Association, in its annual comprehensive report on all aspects of medical education, announced that the 1958-59 graduating class receiving the M.D. degree numbered 6,860, only one less than in 1957-58.

These two classes were the largest except for the 1954-55 year when the class was 6,977. The increase in that term was occasioned by including as graduates the fifty students completing the intern year then required by Stanford University.

Forty-three medical schools had decreases in the number graduated while thirty-four schools experienced increases.

Women comprised 5.4 per cent of the graduating class and comprised 5.9 per cent of the Canadian 1958-59 graduating class.

Need For Adequate Medical Education Opportunities Grows

Much of the council's report dealt with educational opportunities for the number of medical students considered adequate to satisfy medical service needs in a vastly growing population.

"To accomplish this task and at the same time maintain high standards of medical education represents a challenge at least as important as any problem facing medicine today," the AMA report said.

The council indicated a need for 10,000 graduates a year from medical schools in the United States by 1975.

"The fundamental issue," the report said, "does not involve the question of which of various studies have resulted in the most accurate estimate of the need for increased numbers of medical school graduates. The basic and urgent concern is that all estimates indicate a need for expansion of educational facilities in medicine in a brief period which far exceeds any expansion of such facilities that has occurred in a similar period during modern times."

The council offered several methods which could be used to meet the need for expanded educational facilities in medicine, including increased capacity of existing medical schools, but then added:

"Care must be exercised that medical schools not be induced to expand beyond their capacity to maintain the proportionately increased teaching staff necessary to preserve high standards of education and research."

New Medical Schools Needed

The council estimated that even though existing schools are expanded, "it appears likely that at least ten new schools with an average graduating class of one hundred students will be required" to meet the health care needs of an exploding population.

On the subject of medical students of the future, the council said:

"Medicine is finding increased competition for the pool of top-ranking students because it no longer occupies the unique position as a profession which it held in the past and shared largely only with law and the ministry. The professions open to the college graduate are now much broader, and they provide the prestige, intellectual satisfaction, and financial rewards comparable to those offered by medicine."

The council cautioned:

"Medicine must make active efforts to inform young people of the breadth of interests and challenges it offers or surely it will suffer a serious loss of the best young talent."

Other important points in the council's report are:

The total enrollment in first year medical school classes for the 1958-59 academic year was 8,128, the largest to date in the United States. Entering class sizes increased in thirty-five schools, were unchanged in twenty-four, and decreased in twenty-six.

In 1958-59, a total of 59,102 applications were filed by 15,170 persons or an average of 3.9 applications made by each prospective medical student.

Of all first-year medical students, more than one-third, 37 per cent, came from five states: New York, Pennsylvania, California, Ohio and Illinois.

At least two-thirds of the entering classes comprise "B" average students. About one-sixth had college grade averages of "A" and about one-sixth to one-seventh had "C" averages.

AHA ANNUAL SCIENTIFIC SESSIONS SET NEW ATTENDANCE RECORD

A new attendance record of more than 5,000 physicians, scientists and lay leaders was set at the 1959 Annual Meeting and Scientific Sessions of the American Heart Association in Philadelphia, October 23-27. This figure compares with 3,375 who attended the 1958 meetings in San Francisco.

Interest in the scientific program this year was heightened by daily sessions on clinical cardiology, a joint program with the American College of Cardiology, a special session for nurses, and an address by Secretary Arthur S. Flemming of the U. S. Department of Health, Education and Welfare on "The Role of Voluntary Health Associations in Meeting Future Health Needs."

Report from Dallas . . .

Important Actions Taken by AMA House of Delegates

Freedom of choice of physician, relations between physicians and hospitals, a scholarship program for deserving medical students and relative value studies of medical services were among the major subjects acted upon by the House of Delegates at the American Medical Association's Thirteenth Clinical Meeting held December 1-4 in Dallas.

Total registration through Thursday, with half a day of the meeting still remaining, had reached 4,727, including 2,742 physicians.

Freedom of Choice

In considering four resolutions which in various ways would have changed or replaced the statements on freedom of choice of physician which the House adopted in June, 1959, when acting upon the recommendations in the report of the Commission on Medical Care Plans, the House reaffirmed the following two statements approved in Atlantic City:

1. "The American Medical Association believes that free choice of physician is the right of every individual and one which he should be free to exercise as he chooses."
2. "Each individual should be accorded the privilege to select and change his physician at will or to select his preferred system of medical care, and the American Medical Association vigorously supports the right of the individual to choose between these alternatives."

However, in order to clarify and strengthen its position on the issue of freedom of choice of physician, the House also adopted this additional statement which was submitted as a substitute amendment on the floor of the House:

3. "Lest there be any misinterpretation, we state unequivocally that the American Medical Association firmly subscribes to freedom of choice of physician and free competition among physicians as being prerequisites to optimal medical care. The benefits of any system which provides medical care must be judged on the degree to which it allows of, or abridges, such freedom of choice and such competition."

Physician-Hospital Relations

The House received twelve resolutions on the subject of relationships between physicians and hospitals. To resolve any doubt about its position, the House did not act upon any of the resolutions but instead reaffirmed the 1951 "Guides for Conduct of Physicians in Relationships with Institutions." It also declared that "all subsequent or inconsistent actions are considered superseded."

The House also accepted recommendations that (1) the House of Delegates acknowledge the need to strengthen relationships with hospitals by action at state and local levels, (2) the Board of Trustees of the Association continue to maintain liaison with the Board of Trustees of the American Hospital Association, and (3) the Council on Medical Service review this entire problem to ascertain if there have been actions inconsistent with the 1951 Guides.

Those Guides summarize the following general principles as a basis for adjusting controversies:

1. "A physician should not dispose of his professional attainments or services to any hospital, corporation or lay body by whatever name called or however organized under terms or conditions which permit the sale of the services of that physician by such agency for a fee.
2. "Where a hospital is not selling the services of a physician, the financial arrangement if any between the hospital and the physician properly may be placed on any mutually satisfactory basis. This refers to the remuneration of a physician for teaching or research or charitable services or the like. Corporations or other lay bodies properly may provide such services and employ or otherwise engage doctors for those purposes.
3. "The practice of anesthesiology, pathology, physical medicine and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine."

Scholarship Program

To help meet the need for an increasing number of physicians in the future, the House approved the creation of a special study committee which was asked to:

1. Present a scholarship program, its development, administration and the role of the American Medical Association in fulfilling it.
2. Ascertain the maximum to which medical schools could expand their student bodies while maintaining the quality of medical education.
3. Ascertain what universities can support new medical schools with qualified students and sufficient clinical material for teaching—either on a two year or a full four year basis.
4. Investigate the securing of competent medical faculties.
5. Investigate financing of expansion and establishment of medical schools.
6. Investigate financing of medical education as to the most economical methods of obtaining high quality medical training.
7. Develop methods of getting well-qualified students to undertake the study of medicine.
8. Investigate the possibility of relaxing rigid geographic restrictions on the admission of students to medical schools.

The House urged that the special committee be implemented promptly with adequate funds and

staff so that it may make an initial report by June, 1960.

Relative Value Studies

Reaffirming a previous policy statement, the House approved in principle the conducting of relative studies by each state medical society, rather than a nationwide study of a series or regional studies by the A.M.A. The House also reiterated its authorization for the Committee on Medical Practices to inform each state medical association, through regional or other meetings, of the purpose, scope and objectives of such studies, the steps to be followed in conducting studies, the problems which may be encountered and the manner in which the results can be applied.

The House recognized, however, that some state medical societies are either not interested in relative value studies or are actively opposed to them. It pointed out that some state medical associations fear that the regional conferences of the Committee on Medical Practices will put pressure on them to carry out such studies and that this will result in the adoption of "fixed fees."

Since the regional conferences are educational in nature, the House said, it remains for each state or county medical association to accept or reject the idea of a study in its area.

The House expressed awareness of the fact that this is still a controversial matter. However, it commended the Committee on Medical Practices for its effort to carry out the instructions of the House, and it urged the committee to continue its educational work.

Miscellaneous Actions

In considering forty-four resolutions and a large volume of annual, supplementary and special reports, the House also:

Learned that the AMA Board of Trustees has appointed a liaison committee to meet with a similar committee of the *American Osteopathic Association* to consider matters of common concern;

Emphasized that local medical societies should insure that no member violates ethical traditions as they relate to ownership of pharmacies or stock in pharmaceutical companies;

Called for investigation of the need, desirability and feasibility of establishing a home for *aged and retired physicians;*

Suggested that fees for consultative examinations under programs of the *Bureau of Old Age and Survivors Insurance* should be adjudicated directly between the state medical society and the state agency involved;

Registered a strong protest to the *Veterans Administration,* urging stricter screening of non- service-connected disability patients admitted to government hospitals;

Reiterated the Association's support of the *Blue Shield* concept and directed the Council on Medical Service to submit at the June, 1960, meeting its recommendations concerning a policy statement on A.M.A. relationship with Blue Shield plans;

Urged that *medical schools* include in their curricula a course on the social, political and economic aspects of medicine;

Suggested that the AMA make available to school libraries *information and literature* showing the advantages of private medical care and the American free enterprise system;

Recommended that all state and county medical societies establish programs for the inspection and testing of all *fluoroscopes and radiographic equipment;*

Called upon each individual physician to wage "a vigorous, dynamic and uncompromising fight" against the *Forand type of legislation;*

Urged state and local medical societies and individual physicians to implement the AMA program for recruitment of high-grade *Medical students;*

Reaffirmed the "Suggested Guides to Relations Between Medical Societies and *Voluntary Health Agencies,*" which were adopted at the December, 1957, meeting in Philadelphia.

At the Tuesday opening session, six state medical societies presented nearly $250,000 to the American Medical Education Foundation. The checks turned over to Doctor George F. Lull, President of AMEF were; California, $156,562; Indiana, $35,570; New York, $19,546; Utah, $10,355; New Jersey, $10,000 and Arizona, $9,263.

MEDICAL LEGAL OPINIONS

(Continued from Page 66)

care during such period of time of the infant born to such mother.

"Chronic or convalescent care" means (1) care required by a person because of prolonged mental or physical illness or defect or during recovery from injury or disease and shall include any or all of the procedures commonly employed in caring for the sick; and (2) care incident to old age required by a person who because of advancing age is not capable of properly caring for himself and shall include necessary personal or custodial care. The furnishing of board, room, and laundry shall not in itself be deemed care incident to old age.

Nothing in sections 144.50 to 144.56 shall authorize any person, partnership, association, or corporation, nor any state, county, or local governmental units, nor any division, department, board, or agency thereof, to engage, in any manner, in the practice of healing, or the practice of medicine, as defined by law.

(Section 144.50—Minnesota Statutes 1957)

A violation of the above law is a misdemeanor punishable by a fine and a jail sentence.

(Section 144.49, Subd. 7—Minnesota Statutes 1957)

History of Medicine in Minnesota

PIONEER PHYSICIANS OF STEVENS COUNTY, MINNESOTA

JOSEPHINE EDDY, GRACE HALL
A. I. ARNESON, M.D.
Morris, Minnesota

ROBERT ROSENTHAL, M.D.
Saint Paul, Minnesota

(Continued from October 1959 issue)

Dr. Charles L. Gates seems to have practiced in Morris before graduation from a medical school. His professional card published on November 23, 1876, read: "Dr. C. L. Gates, Physician and Surgeon, Office hours: Morris 8:30-9:30 A.M. Office in Benson on 4th Street," and a newspaper item of August 25, 1876, reports the amputation of a thumb of a very sick lady by Dr. Gates. He graduated from the Medical College in Cincinnati, Ohio, in 1877, and was a homeopath. After his graduation he came to St. Paul and pursued his medical studies for nearly three years with Dr. C. G. Higby.†

Then he went to Benson, Swift County, and settled down to the practice of medicine. Supposedly, he was in Benson for nine years, but as he moved to Hancock in 1883 it seems very unlikely that he was nine years in Benson even if his practice prior in 1877 is included. His practice then developed into an extensive one. He was very active in all public affairs and educational and religious matters. He organized the first Sabbath School and prayer meeting in Benson.

In 1883 Dr. Gates came to Hancock where he already had a large business. He ranked high in that community as a physician because of his excellent character and his integrity. He was the first physician to locate in Hancock.

Dr. Gates was born in Tioga County, New York, on June 11, 1847, the son of Lattimer B. and Elizabeth (Sanford) Gates, both natives of the state of New York. As mentioned, he received his medical schooling at the Medical College of Cincinnati, Ohio, from which he graduated in 1877. He was licensed to practice in Minnesota as a homeopath on December 31, 1883. His preceptor in St. Paul, Dr. Higby, also practiced homeopathic medicine. An old timer remembered § that when he was a child Dr. Gates came to treat his seriously ill brother. He drove a team of rather small speckled ponies and apparently made his calls whenever the notion struck him, though he did not seem to charge for all of them.

Dr. Gates was medium tall, of slight build, had rather sharp eyes and a clipped beard. He spoke in a very quiet, low voice supposedly because of his deafness. He always carried a small black satchel containing his drugs. The doctor usually left two small glass vials, each about two inches long, one of which contained a water-like liquid and one a powder very much like sugar.

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†Dr. Chester Goss Higby (1835-1908) was, like Dr. Gates, born in the state of New York. He graduated from the Hahnemann Medical College Hospital, Chicago, in 1870. He first practiced in Red Wing, but moved to St. Paul in 1873 or 1874. He was very active in the affairs of homeopathic societies.

§Communication of Joe E. O'Neil, Morris, Minnesota, March, 1956.

Dr. Gates seems to have developed a successful practice and he was called long distances from Hancock to treat seriously ill patients. It seems his old patients were loyal to him and it is known that at least until 1890 he made regular visits every Friday to Benson, where he had practiced before coming to Hancock. His loyalty to, and trust in, his old preceptor, Dr. Higby, is shown by the fact that at least once he called him as consultant to Stevens County and that he put himself under Dr. Higby's care when he was very ill in the winter of 1892-1893. This illness had started in the first half of December, 1892; in January, he went to St. Paul to Dr. Higby. His illness gave rise to a great deal of anxiety among his friends, and he did not begin to resume practice until March, 1893.

Dr. Gates married Harriet E. Cook at Benson on August 27, 1879. In political matters he was a Republican. He belonged to the Congregational Church. His death came suddenly; he was killed by a train on June 9, 1910, while he walked along the railroad. No doubt his deafness was a contributing factor.

Dr. William M. Goucher came to Morris in 1878. His professional card appeared in the *Stevens County Tribune* of July 4, 1878: "Dr. W. M. Goucher, office at Teel's Drug Store. Residence, Perkins Hotel, Morris, Minnesota."

The memories of his practice in Morris are not pleasant due to an occurance a year after he came there. It is difficult at this time to judge the case impartially. The *Stevens County Tribune* of July 4, 1879, related the story of a criminal attack on a girl of "good character" who, on the way from Herman, Grant County, passed through Morris and became ill with what the physician who treated her called a "bilious fever." The story goes on to tell that Dr. Goucher forced his way into her room during the night, told her not to take any more of the first doctor's medicine, and then assaulted her. Dr. Goucher was jailed, but later released for lack of evidence. In September, the same newspaper tells that the girl never left her bed after the attack and that the excitement and fright threw her into a dangerous fever. The newspaper seems to be convinced of his guilt.

It is difficult to accept this case as it appears in the papers, although it is true that Dr. Goucher had the reputation of intemperate habits. There is a story that a farmer near Morris needed help in threshing and Dr. Goucher offered to help him. After a few hours of good work, two of his cronies arrived with a bottle of whiskey, the three retired behind a straw-stack and from then on the doctor was of little help. He was a man of medium size, reddened face and very muscular. He was a friendly person and always kind to children, though he seemed to associate more with the rougher elements. All this may be a reason why many people thought he might not be incapable of committing the deed of which he was accused. The circumstances of the supposed crime—the girl suffered from a "bilious fever"—and the long "dangerous fever" following the deed—seem to throw some doubt on the whole affair. One wonders whether a psychiatric examination of the patient could have shed some more light on the incident.

It seems he continued to practice in Morris, as we find his professional card in November, 1880: "W. M. Goucher, physician and surgeon. Consultation in German and English. Office over Helgeson and Hanson's Store, Atlantic Ave., Morris, Minnesota." But in April, 1881, a newspaper reported recovery of an injured patient who was successfully operated on by Dr. Goucher of Graceville, Big Stone County: He is considered the first physician to locate in Graceville.

In October of that year, he advertised in a Morris newspaper, giving his address in Graceville. On April 13, 1882, he is again reported in Morris: "He is about to open an office and resume practice at this place," and in June he is reported to have purchased the building in which his office was located. In

September, 1882, his card reads ". . . office at his residence on Pacific Ave., Morris . . ."

Dr. Goucher left Morris again in October, 1884, to locate once more in Graceville. Polk's Medical Directory lists him as practicing in Graceville in 1886. In the spring of the same year we learn that he died suddenly from vascular heart disease (*Graceville Transcript,* April 1, 1886). His wife came from St. Paul too late to see him before he was placed in the casket. One may speculate whether she was just visiting in St. Paul or whether they were separated. It seems he was not a successful physician, because the newspaper states that "friends provided a neat suit of garments" for his funeral. He was buried in the Protestant cemetery.

Not much is known of Dr. Goucher's background. It seems he came originally from the East, because in September, 1882, he returned from the East where he visited his aged parents. During the Civil War he served as Army surgeon. Nothing is known of his medical education. After the Minnesota Medical Act went into effect, he was authorized to practice under the "years of practice section."

Dr. Thomas E. Heenan came to Stevens County in 1878. He was born in Philadelphia on March 29, 1849. His medical education was received at the Medical Department of the University of Pennsylvania, where he earned his M.D. degree. He came to Stevens County in April, 1878, with the idea of doing big farming. His professional card—"Thomas E. Heenan, physician and surgeon, Morris, Minn."—appeared as early as April, 1878. It seems he did not become established at once, because a newspaper item of February 6, 1879, states that he returned a few days before (apparently from a visit to the south of the state) and that he is going to open an office in the village and practice his profession. He did not neglect, however, his primary interest—farming—and had 500 acres ready for seeding by the end of March, 1879. Soon he also owned one of the finest stallions in the county.

It seems he did not open a regular office, or that he opened a new one, as a news item of March 4, 1880, states that he "is about to open an office in this village and has engaged the front rooms in Christensian's building which he is having fitted and furnished in metropolitan style." By the end of March, his office was actually being used. There is no doubt, however, that he practiced from at least 1879 on. His is the honor of having written prescription No. 1 of the drugstore which is now the Arneson Drugstore. It is dated February 26, 1880, and called for pills of quinine sulphate. Many newspaper items between 1880 and 1884 attest that his medical services were frequently used in severe cases.

Dr. Heenan was of aristocratic appearance. He was tall and slender with dark eyes and wavy dark hair. In winter, he wore a buffalo coat made of the finest dark skins. He was a bachelor.

In politics he was a Democrat. In an article published June 27, 1884, the following appears:

> "The Democrats of Stevens County are to be congratulated upon the recognition they have received in the recent state convention in the election of Dr. Thomas E. Heenan as one of the delegates from the Fifth District to the Chicago Convention. No more fitting representative of the young and earnest democracy of the State could have been chosen and that he was so chosen is due entirely to his own personal qualities and their recognition by the Democrats of the district. Stevens County will have a voice in naming the next President of the United States."

Besides his political activities, practicing his profession and farming, Dr. Heenan held the offices of commissioner of bridges on the Pomme de Terre River, county auditor, and surgeon for the Northern Pacific Railroad in Stevens County.

He was endorsed by both Republican and Democratic newspapers in Minnesota as United States Minister to Sweden. This position did not materialize, but in the November 5, 1885, issue of *The Sun,* the appointment of Dr. Heenan as U. S. Consul to Odessa, Russia, was announced. It pays tribute to him as an able physician and to his popularity, as shown in part by his election as county auditor. It quotes the *St. Paul Globe,* which states, among other points, that "He is recognized as a good physician and a man of sound character and judgment." A forcible message to Dr. Heenan was printed in the *Sun* of December 17, 1885.

The appointment as Consul to Odessa is actually dated October 29, 1885. It seems that he was well fitted for this diplomatic post, because he was later (March 30, 1907) appointed Consul General at Newshwang, China, and Consul on June 10, 1908. In January, 1909, he became Consul at Warsaw, Poland, and on April 24, 1914, Consul at Fiume, Hungary. At this last post he did not assume charge until June 24, and the very next day—on June 25, 1914—he died of a heart attack.§

It seems his only surviving relative was a sister, Mrs. St. Clair Mulholland of Philadelphia.

Dr. William E. Holden came to Morris in 1875. His professional card on November 23, 1876, read: "Wm. E. Holden, M.D., Physician and Surgeon. Residence, Pacific Avenue, Morris, Minn. Professional calls attended both day and night. Patients from abroad can be accommodated with board." He took the place of Dr. E. R. Wait.

The *Stevens County Reporter* of March 31, 1877, lists him among the professional men as the only physician in Morris.

His practice took him to Hancock and Benson, Swift County, but it is very doubtful that he actually located there. In March, 1878, he moved to Glenwood, Pope County. There he lived in a small house which he also used as a sort of drugstore. His wife ran a boarding and lodging house in the same building. Because of insufficient space, he moved his drugs to the Bartke Hall and established there a drugstore—the first real drugstore in Glenwood. It seems he was active in civic affairs in Pope County. In 1878 he was elected county coroner and held this position until he left the county. He was also justice of the peace in Glenwood. In the fall of 1879 his store of drugs was moved into the H. N. Rue store, and Dr. Holden left the county. Mr. Rue took over Dr. Holden's drug business and Dr. Holterman his practice.† According to a newspaper item of February 19, 1880. Dr. Holden located at Herman, Grant County. He is listed there through 1890 but in 1893 we find him in Ashby, Grant County, and that is the location he gave when he received his Minnesota license, according to the *"Official Register, Physicians in Minnesota, 1883-1890."*

He was born in New Hampshire; his wife in Indiana. A son was born to them in Glenwood in February, 1878. Nothing is known of his medical background, nor when and where he died.

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§The information about his diplomatic career was supplied by the National Archives and Records Service in Washington, D. C. (10/3/1956).

†From an unpublished biographical sketch by Mr. Roy Skinner (1936), Pope County.

He was born in New Hampshire; his wife in Indiana. A son was born to them in Glenwood in February, 1878. Nothing is known of his medical background, nor when and where he died.

Dr. Horton evidently practiced medicine in Hancock, in the year 1886 as the following item appeared in the local paper May 20, 1886: "Our physician, Dr. Horton, understands his business and is meeting with good success. All who require his services need not fear placing their case in his hands."

In January of 1887, Dr. Horton contracted typhoid fever and passed away from the disease. On January 13, 1887, the following item appeared in the local news:

"The funeral of Dr. Horton took place today from the Merchant's Hotel. The parents of the deceased were in attendance. For sanitary reasons, the fatal disease—typhoid fever—being considered contagious, the parents were not allowed to remove the remains to their residence for burial."

Nothing more is known about him, not even his first name.

Dr. H. L. Hulburd was born in Lawrenceville, New York, September 1, 1851. His father was Lucius Hulburd, a native of Vermont. His mother, before her marriage, was Cordelia Whittemore, also a native of Vermont.

Dr. Hulburd was graduated from Lawrenceville Academy in 1875. He was married June 22, 1873. After graduation they moved to Prescott, Wisconsin, where he practiced two years, moving to Morris in 1878.

In appearance, Dr. Hulburd was a rather small man with sandy colored hair. He sometimes let his beard grow in the winter when he had driving to do. It was heavy and decidedly red. He was always well groomed. He liked flowers and in season wore a small white myrtle flower in his buttonhole. He drove an old fashioned Boston chaise which he used for professional driving and family use. He was a kindly quiet man, one to inspire confidence by his manner. In the years of adversity which struck Stevens County soon after the arrival of Dr. Hulburd, no call for help ever came to him to which he did not respond. He was painstaking and liberal with his services and gave freely to charity.

His favorite prescription for children was Castoria, accompanied by candy or a penny. Besides his regular practice he extracted teeth—charging fifty cents for one extraction. His name is signed to prescription No. 3 in the files of the present Arneson Drug Store in Morris. Dr. Hulburd conscientiously kept abreast of the times, making special study of the use of the x-ray. He was offered the x-ray work in a large hospital in Los Angeles, California. In 1895 he went to New York and "took a course in lung treatment and expects to make that a specialty; also the cure of that dreadful disease, consumption," according to the *Morris Tribune*.

Dr. Hulburd was a member of the Congregational church of Morris and was very active in church work. He was a trustee for many years. In political life he was a Republican. He belonged to the Masonic, Maccabees and United Workmen's Lodges. He was the last charter member of the Morris Workmen's Lodge living in Morris at the time of his death. He was a member of the American Medical Association, the Minnesota State Medical Society, the West Central Medical Society, and was very prominent in medical circles in this section of the state. He was county coroner and county physician for many years and was holding the position of county physician at the time of his death. He was also a member of the pension medical examining board.

Dr. Hulburd experimented for some time with a telephone and finally had one connected between his residence and Moore's Drug Store in August, 1879, the first telephone in the village.

Dr. Hulburd died at his home, Saturday afternoon, May 16, 1916, after an illness of several weeks with blood poisoning in his left hand, contracted while caring for a patient. The news of his death cast a gloom over the whole city. The funeral was held in the home as the doctor had requested. From three until four o'clock the business houses of Morris were closed as a token of respect for the memory of the beloved physician. He was buried in the Morris Summit Cemetery. He was survived by his wife, Margaret, and one daughter, Cora.

Many were the expressions of regret and sorrow at his passing in the *Morris Tribune* of May 19, 1916. Frank Hancock wrote:

"Dr. Hulburd was one of the best men I have ever known. He was a man of noble impulses who gave freely of his time and money to the distressed. His deeds of charity will never be known. He was a high grade citizen in every respect." And E. J. Jones: "He was one of the best men I have known anywhere. He was most unselfish, kind and generous and was always looking for an opportunity to do good. Words fail to do justice to his memory."

A teacher who taught in Morris in the early 1900's and for several summers helped him in his office wrote in a letter:

". . . he had sense of humor, a kind heart and was the finest type of Christian gentleman . . . he was respected, admired but especially loved. . . ."

Dr. Henry Peter Johnson practiced in Hancock up to 1882.* It is not known when he came there but, as he graduated from Rush Medical College in 1879, he probably came there around 1880. Dr. Johnson was born on February 3, 1855, near Oshkosh, Wisconsin, and as an infant moved with his family to the settlement of Pleasant Hill, Fremont township, in Winona County, Minnesota. His early education he received in Houston County and in Winona. After teaching two terms of school, he entered Rush Medical College in Chicago from which he graduated, as mentioned, in 1879.

In 1882 he moved to the village of Houston, Houston County. He practiced there for ten years and was county coroner for a number of years. In 1892 he moved to La Crosse, Wisconsin. After four years there, he moved to Long Prairie, Todd County, and finally to Fairmount, Martin County. There he owned and operated the Johnson Hospital for several years. He died in Fairmount on March 31, 1943.

Dr. George M. Lambert was in Morris only a few months. His professional card appeared in the local paper in June, 1877, stating that he was "late surgeon 4th Regiment, Minn. Volunteers, Morris, Minn. Professional calls promptly attended to by day or night." He died on August 30 of the same year at the tragically early age of thirty-six. One is justified in assuming that the illness which caused him to resign his position as prison physician at Stillwater—"Dropsy of the heart"—was the cause of his death. He was buried at Morris, but later exhumed at the request of his wife and transferred to St. Paul.

Dr. Lambert was born in the state of New Jersey in 1841, the son of Judge Henry A. Lambert of St. Paul. He had come to Minnesota when he was very young and received a good education. He graduated from Georgetown College,

*From the extended biographical sketch in "Notes on the History of Medicine in Houston County prior to 1900" by Nora H. Guthrey: Minnesota Medicine, 38:931 and 1005 (Nov. and Dec.) 1955.

Washington, D. C., and later from Miami Medical College, Cincinnati, Ohio. Soon after that** he was appointed surgeon of the 4th Minnesota Infantry Volunteers and served through the entire Civil War. When he returned† he became physician at the prison at Stillwater, from which position he had to resign because of illness.

Dr. Charles Laurel.—A news item appeared in the local paper on September 30, 1880, as follows: "Dr. Charles Laurel, an M.D. from Kansas,‡ has arrived in Morris and contemplates locating here permanently. The doctor converses in English, German and Scandinavian." Evidently the doctor located in Benson, Swift County, instead, or stayed only a very short time in Morris, as on June 30, 1881, the following business notice appeared in the paper: "Dr. Charles Laurel of Benson will visit Morris the first, second and third days of each month."

However, the last insertion of the notice appeared on July 28, 1881, and no other reference was made of him. Nothing more is known of him, and his name does not appear in *Polk's Medical Directory* of 1886.

Dr. George Henry Mesker§ practiced in Chokio about a year, from shortly after his internship in the Minneapolis General Hospital in 1896 until 1897 when he moved to Olivia, Renville County.

He was born on July 10, 1873, in the township of Kelso, Sibley County, and received his preliminary education in Henderson. He studied medicine at the University of Minnesota, graduating in 1896. He did not stay long enough in Stevens County to become well known. In Olivia he practiced for over fifty years and became one of the best known physicians of Renville County. Dr. Mesker was a very civic-minded citizen; he was on the school board for thirty-three years, on the village council several years, and at one time was mayor of Olivia. For ten years he was a board member and president of the Riverside Sanatorium committee.

In 1943 he joined the Army Medical Corps and was stationed in Savage, Minnesota, in Pueblo, Colorado, and St. Louis, Missouri. He returned to Minnesota in 1945 and, after working as a psychiatrist at the Cambridge State Hospital, he located again in Olivia.

He was one of the organizers of the Camp Release District Medical Society, a charter member of the Renville County Medical Society, and the first president of the Renville-Redwood Medical Society. He was a member of the Minnesota State Medical Association and its "50 Club," and the American Medical Association.

Dr. Mesker reaped many honors: a plaque for his service on the school board, a citation for his work in behalf of the Riverside Sanatorium, and he was one of the two physicians honored at the fifty-fourth annual Old Settlers reunion in 1955.* He died on November 19, 1956, from cardiovascular disease.

**Dr. G. M. Lambert went to Stillwater in 1861 ("Medicine in Washington and Chisago Counties," MINNESOTA MEDICINE, July 1938, p. 506).

†According to the same medical history (p. 568) a Dr. George A. Lambert came to Stillwater in 1872. This probably refers to the same man.

‡The State Historical Society of Kansas was unable to trace Laurel in that state.

§Obituary in MINNESOTA MEDICINE, January, 1957, and *Olivia Times-Journal,* November 22, 1956.

**Olivia Times-Journal,* June 30, 1955.

Dr. G. Olsen's professional card appeared in a Morris newspaper of August 3, 1879, "G. Olsen, late of Germany, physician and surgeon. Office at Helgeson and Hanson's Store, Morris, Minn." The same paper announces that Dr. G. Olsen had arrived in Morris and guarantees a cure or no pay. Nothing more is known of him.

Dr. Arthur R. Pollock, a graduate of the medical department of Washington University (St. Louis Medical College) St. Louis, in 1898, was licensed on June 16 of that year and recorded his license in Stevens County in the following month. He located in Chokio, which at that time was a village of 200 people. He was elected president of the Chokio Board of Health and he was examiner for the New York Life Insurance Company, the Northwest Mutual and other insurance companies. In March, 1900, he moved to Graceville, Big Stone County, where he took over Dr. R. D. Alway's practice. He is listed in Graceville through 1905, though according to other information, he is listed in Antonio, Conejos County, Colorado, in 1904 and 1906. In 1908 and 1909 he was in Ely, Pine County, Nevada.

Dr. William Davidson Rea had a big "write-up" in the *Morris Tribune* of January 5, 1901. "An audience of men and women, 600 of them, listened to a medical address given by Dr. Rea. His greatest success and the rapidity of his cures are a revelation to the special practice of medicine. His office is daily thronged with patients from all parts of the state . . ." and he continues in the same vein of a typical quack. He claims to have taken special courses besides the regular ones and to have a system with which he cures the most obstinate chronic diseases. He has studied "in the principal hospitals of Europe and America." He started early to devote himself to medicine; coming "from a stock of long-lived physicians, he inherited to a degree certain instincts . . ." and it continues *ad nauseum.* "Dr. Rea will continue to visit professionally the principal cities of the Northwest every four weeks as usual. Morris, Morris Hotel." —January 31, 1901.

He was born in Milton, Kentucky, in 1864, and graduated from the Hospital College, Louisville, Central University in 1888. In 1898 he was in Minneapolis, but soon moved to New Ulm, Brown County. From about 1903 to 1909 he was again in Minneapolis and then practiced as an itinerant physician in various parts of Minnesota and in a number of other states. He was licensed in Minnesota by examination in June, 1898, but later secured licenses in South Dakota, Missouri, Illinois, Texas and Georgia. Finally, in 1936, his Minnesota license was revoked because of "grossly improbable statements."

(To be concluded in the April issue)

Meetings and Announcements

INTERNATIONAL

Sixth International Congress on Diseases of the Chest, American College of Chest Physicians, Council on International Affairs, Vienna, Austria—August 28-September 1, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

Third International Congress of Physical Medicine, Washington, D. C., August 21-26, 1960.

Second International Symposium on Changing Concepts in Medicine (Congenital Heart Disease), Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 28, 29, 30, 1960. For further information write Doctor Charles P. Bailey, The Deborah Hospital, Browns Mills, New Jersey, or Doctor Charles P. Bailey, Deborah National Office, 901 Walnut Street, Philadelphia 7, Pennsylvania.

American Institute of Ultrasonics in Medicine, Second International Conference, Statler-Hilton Hotel, Washington, D.C., August 20, 1960.

NATIONAL

American College of Chest Physicians, Twenty-sixth Annual Meeting, Miami Beach, Florida, June 8-12, 1960.

American College of Chest Physicians Council on Postgraduate Medical Education, Thirteenth Annual Postgraduate Course, Diseases of the Chest, Sheraton Hotel, Philadelphia, Pennsylvania, March 14-18, 1960.

Hawaii Medical Association, 104th Annual Meeting, Honolulu, Hawaii, May 12-15, 1960.

District of Columbia Dental Society, Twenty-eighth Annual Postgraduate Clinic, Shoreham Hotel, Washington, D. C., March 13-16, 1960. For further information write District of Columbia Dental Society, 1835 Eye Street, N.W., Washington 6, D. C.

New Orleans Graduate Medical Assembly, Twenty-third Annual Meeting, Roosevelt Hotel, New Orleans, Louisiana, March 7-10, 1960. For further information write Secretary, Room 103, 1430 Tulane Avenue, New Orleans 12, Louisiana.

The Biophysical Society, Fourth Annual Meeting, Sheraton Hotel, Philadelphia, Pennsylvania, February 24-26, 1960. For further information write to H. P. Schwan, Chairman, Local Arrangements, University of Pennsylvania, Philadelphia 4, Pennsylvania, or to O. H. Schmitt, Chairman, Program Committee, University of Minnesota, Minneapolis 14, Minnesota.

American College of Allergists Graduate Instructional Course and Annual Congress, The Americana Hotel, Bal Harbour, Miami Beach, Florida, February 28-March 4, 1960. For further information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

Third Annual Oklahoma Colloquy on Advances in Medicine, University of Oklahoma Medical Center, Oklahoma City, March 24-26, 1960.

The Twenty-third Annual Meeting of the New Orleans Graduate Medical Assembly, headquarters at the Roosevelt Hotel, New Orleans, Louisiana, March 7, 8, 9, and 10, 1960.

The Eleventh Annual Symposium on Recent Advances in the Study of Venereal Diseases, Palmer House, Chicago, Illinois, April 7 and 8, 1960.

University of Colorado Medical Center, Postgraduate Courses; General Practice Review (Sixth Annual), January 10-16, 1960; Physical Medicine and Rehabilitation in Neuromuscular and Medical Conditions, June 1-3, 1960; Conference on Research in Emphysema (Aspen, Colorado), June 17-19, 1960; and Clinical Hematology, June 20-25, 1960 (tentative).

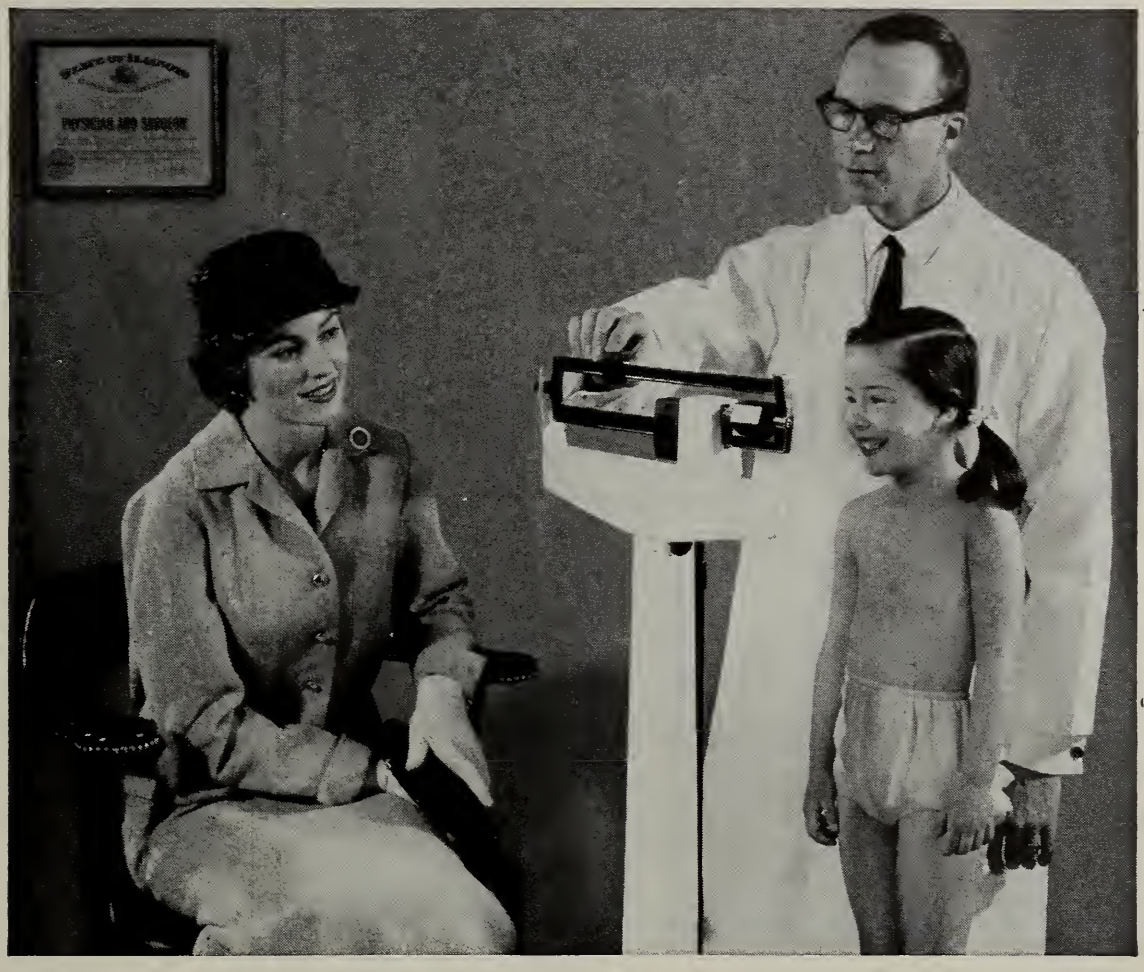
LOCAL

Medical continuation courses to be presented at the Center for Continuation Study, University of Minnesota. February 8-10, 1960, Cardiovascular Diseases for General Physicians and Specialists; February 15-19, 1960, Pediatric Neurology for Specialists; February 29-March 2, 1960, Pediatrics for General Physicians; March 14-16, 1960, Internal Medicine for Internists; March 19, 1960, Trauma for General Physicians; and March 28-April 1, 1960, Endocrinology for General Physicians.

NEW YORK UNIVERSITY COURSE OFFERED

The New York University Post-Graduate Medical School offers the following course, part time, Thursdays, 7:30-9:30 P.M., March 3 through April 21, 1960: *Clinical Physiology: Applications of Basic Physiology to Diagnostic and Therapeutic Problems.*

(Continued on Page A-66)



Underweight Children Gain and Retain Weight with Nilevar®

One of the most convincing evidences of the anabolic activity of Nilevar, brand of norethandrolone, has been its ability to improve appetite and increase weight in poorly nourished, underweight children.

A highly important feature of the weight gain thus produced is that it is not ordinarily manifested by deposition of fat but as muscle tissue resulting from the protein anabolism induced by Nilevar.

Anorexia and "Weight Lag" Study—Brown, Libo and Nussbaum have reported* consistent and definite increases in rate of weight gain in eighty-six patients, ranging in age from 7 weeks to 15½ years. This beneficial action of Nilevar was observed in the patients with organic and traumatic disorders as well as those whose only complaints were poor appetite and/or persistent failure to gain weight.

In this study, the weight gained was not lost after discontinuance of Nilevar therapy although many patients did not continue the sharp gains effected by the drug.

The authors are of the opinion that Nilevar is a highly useful anabolic agent for influencing weight gain in underweight children.

When Nilevar is administered to children a dose of 0.25 mg. per pound of body weight is recommended and continuous dosage for more than three months is not recommended.

Nilevar is supplied as tablets of 10 mg., drops of 0.25 mg. per drop and ampuls of 25 mg. in 1 cc. of sesame oil. Further dosage information in Searle Reference Manual No. 4.

G. D. Searle & Co., Chicago 80, Illinois.
Research in the Service of Medicine.

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*Brown, S. S.; Libo, H. W., and Nussbaum, A. H.: Norethandrolone in the Successful Management of Anorexia and "Weight Lag" in Children, Scientific Exhibit presented at the Annual Meeting of the American Academy of Pediatrics, Chicago, Oct. 20-23, 1958.

New York University Course

(Continued from Page 78)

The lectures summarize the latest concepts of the physiology of the heart, vascular circuits, the kidneys, the lungs, the liver, endocrine glands and the body fluids.

Particular emphasis is placed on principles of metabolism including body fluid and electrolyte metabolism. Fluid and electrolyte problems and metabolic disturbances are investigated as consequences of primary disorders with a view to individualized appropriate treatment. Under the direction of Dr. Norman Deane.

For additional information, write to: Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York 16, N. Y.

PROFESSIONAL NURSE TRAINEESHIP PROGRAM ANNOUNCED

Two new publications on the Professional Nurse Traineeship Program have been announced by Mrs. Apollonia O. Adams, Chief, Division of Nursing Resources, Public Health Service. Under the single title "Professional Nurse Traineeships," the publications are: Part I—A Report of the National Conference to Evaluate Two Years of Training Grants for Professional Nurses, and Part II—Facts About the Nurse Supply and Educational Needs of Nurses.

The Evaluation Conference report contains the major recommendations made by the sixty-eight conferees who met in Washington, D. C., August, 1958, to study the effectiveness of the traineeship program in meeting the needs for nurse administrators, supervisors and teachers. It is also an analysis of the first attempt of this kind by the Federal government to close the gap between the supply and demand for key nursing personnel.

Part II is a revision and up-dating of the source material provided to the conferees. Included is complete information on the nurses who received this aid during the first two years, statistics and graphics on the need for nursing personnel in hospitals, schools of nursing, health agencies, and nursing homes. Much of this material had never been collected before.

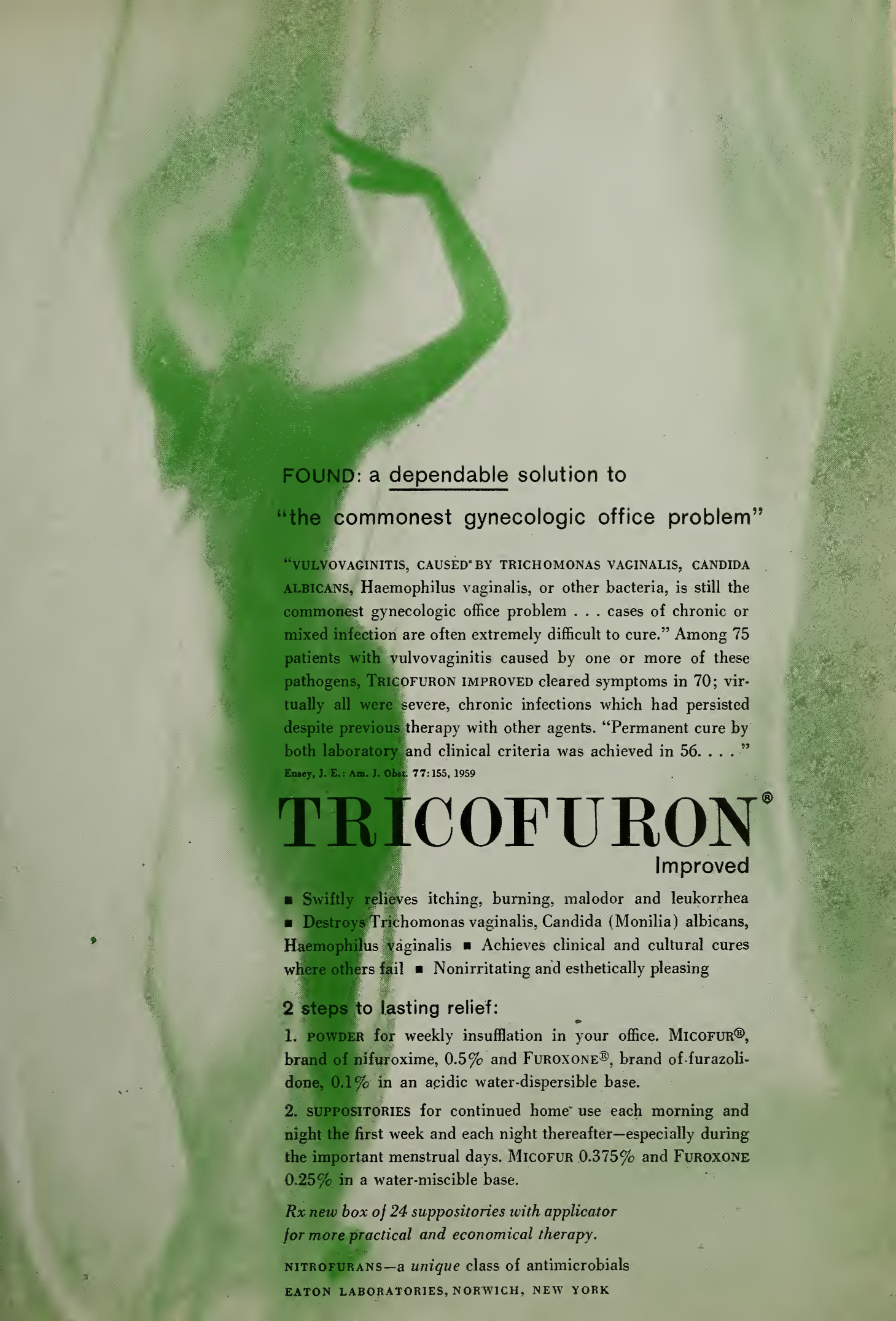
Both publications are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Part I is thirty cents; Part II is twenty-five cents.

ABC RADIO BEGINS NEW FAMILY HEALTH SERIES

A Minnesota physician has been scheduled to appear on one program of a new thirteen-week series of ABC network broadcasts dealing with common illnesses that

(Continued on Page A-68)





FOUND: a dependable solution to "the commonest gynecologic office problem"

"VULVOVAGINITIS, CAUSED BY TRICHOMONAS VAGINALIS, CANDIDA ALBICANS, Haemophilus vaginalis, or other bacteria, is still the commonest gynecologic office problem . . . cases of chronic or mixed infection are often extremely difficult to cure." Among 75 patients with vulvovaginitis caused by one or more of these pathogens, TRICOFURON IMPROVED cleared symptoms in 70; virtually all were severe, chronic infections which had persisted despite previous therapy with other agents. "Permanent cure by both laboratory and clinical criteria was achieved in 56. . . . "

Ensey, J. E.: Am. J. Obst. 77:155, 1959

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■ Swiftly relieves itching, burning, malodor and leukorrhea ■ Destroys Trichomonas vaginalis, Candida (Monilia) albicans, Haemophilus vaginalis ■ Achieves clinical and cultural cures where others fail ■ Nonirritating and esthetically pleasing

2 steps to lasting relief:

1. POWDER for weekly insufflation in your office. MICOFUR®, brand of nifuroxime, 0.5% and FUROXONE®, brand of furazolidone, 0.1% in an acidic water-dispersible base.

2. SUPPOSITORIES for continued home use each morning and night the first week and each night thereafter—especially during the important menstrual days. MICOFUR 0.375% and FUROXONE 0.25% in a water-miscible base.

Rx new box of 24 suppositories with applicator for more practical and economical therapy.

NITROFURANS—a *unique* class of antimicrobials

EATON LABORATORIES, NORWICH, NEW YORK

ABC RADIO BEGINS NEW FAMILY HEALTH SERIES

(Continued from Page A-66)

strike American families, and their treatment by family physicians.

Dr. Paul J. Bilka, Minneapolis internist, will appear on one of the fifteen-minute weekly programs devoted to arthritis.

The new public service radio series began the first week in December over the nationwide network of the American Broadcasting Company.

The series is under the supervision of the American Medical Association and is called "Highroad to Health." It is being presented in cooperation with Lederle Laboratories, a Division of American Cyanamid Company.

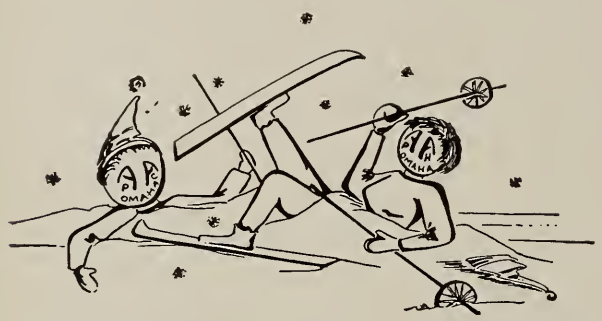
Weekly programs of fifteen minutes each deal with a wide range of health problems from the careless household accident to the burdens created by chronic illness. Subjects to be covered include hypertension, acute childhood infections, cancer, household accidents, toxemia of pregnancy, chronic illnesss, geriatrics, mental health, rheumatic fever, tetanus, surgery, nutrition and medical emergencies.

Each program opens with a nine-minute dramatization of a health problem. This is followed by a five-minute discussion of the problem by a guest physician who also answers questions posed by the program host.

Dr. Gerald Dorman, Eastern Co-Chairman of the Physicians' Advisory Committee on Radio and Television of the AMA, has said of the series, "We feel that 'Highroad to Health' will be a useful link between the public and the medical profession. It will cover a wide range of health problems in a factual, informative answer and will contribute to a better understanding of how the family physician wants to guard family health."

"Highroad to Health" is available to ABC stations each Wednesday at 2:15 P.M. and also each Saturday at 10:30 A.M. Local newspaper program listings or ABC stations should be consulted for exact broadcast schedules.

Minnesota ABC stations are: KATE, Albert Lea; KXRA, Alexandria; KTOE, Mankato; KDMA, Montevideo; WTCN, Minneapolis-St. Paul; KWLM, Willmar; KWNO, Winona; and KMHL, Marshall.



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SOCIETY FOR ADVANCEMENT OF HYPNOSIS ORGANIZED

A group of physicians and dentists in the Twin Cities, who are presently using hypnosis in their practice, are forming a local society devoted to the advancement of hypnosis in medical and dental practice. Physicians or dentists interested in joining the society are asked to contact Frank J. Bonello, M.D., 711 So. Smith Ave., St. Paul 7, Minn. CA. 7-7056.

CHICAGO OPHTHALMOLOGICAL SOCIETY CONFERENCE

The Chicago Ophthalmological Society will hold its annual clinical conference, February 12 and 13, 1960, at the Drake Hotel, Chicago, Illinois.

Guest speakers will include Dr. Walter S. Atkinson, Watertown, N. Y., Dr. Gilbert Baum, Port Chester N. Y., Dr. James Bennett, Cleveland, Ohio, Dr. Paul Cibis, St. Louis, Mo., Dr. Robert Hollenhorst, Rochester, Minn., Dr. Bertha A. Klien, Chicago, Ill., Dr. Peter C. Kronfeld, Chicago, Ill., Dr. Oscar Sugar, Chicago, Ill., Dr. Isaac Tassman, Philadelphia, Pa., and Dr. Derrick T. Vail, Chicago, Ill.

The subjects will include a symposium on retinal disorders, ophthalmo-dynamometry in intracranial vascular disease, observation on cataract surgery, ultrasonography in clinical ophthalmology, photocoagulation of iris and retina, a new surgical approach to lacrimation problems, a neurosurgeon looks at ophthalmology, ligament of Wieger.

Registration fee for the entire course including round table luncheons and dinner following the Gifford Memorial Lecture is $45.00 and may be payable to the Registrar: Mrs. Edward J. Ryan, 1150 North Lorel Avenue, Chicago 51, Illinois.

The sixteenth annual Sanford R. Gifford Memorial Lecture will be delivered by Dr. Walter S. Atkinson of Watertown, New York, on Friday, February 12, 1960, at the Drake Hotel at 5:15 p.m. All ophthalmologists are invited to attend the Gifford Memorial Lecture and the dinner which follows.

as it calms anxiety!

Deprol helps balance the mood by lifting depression as it calms related anxiety

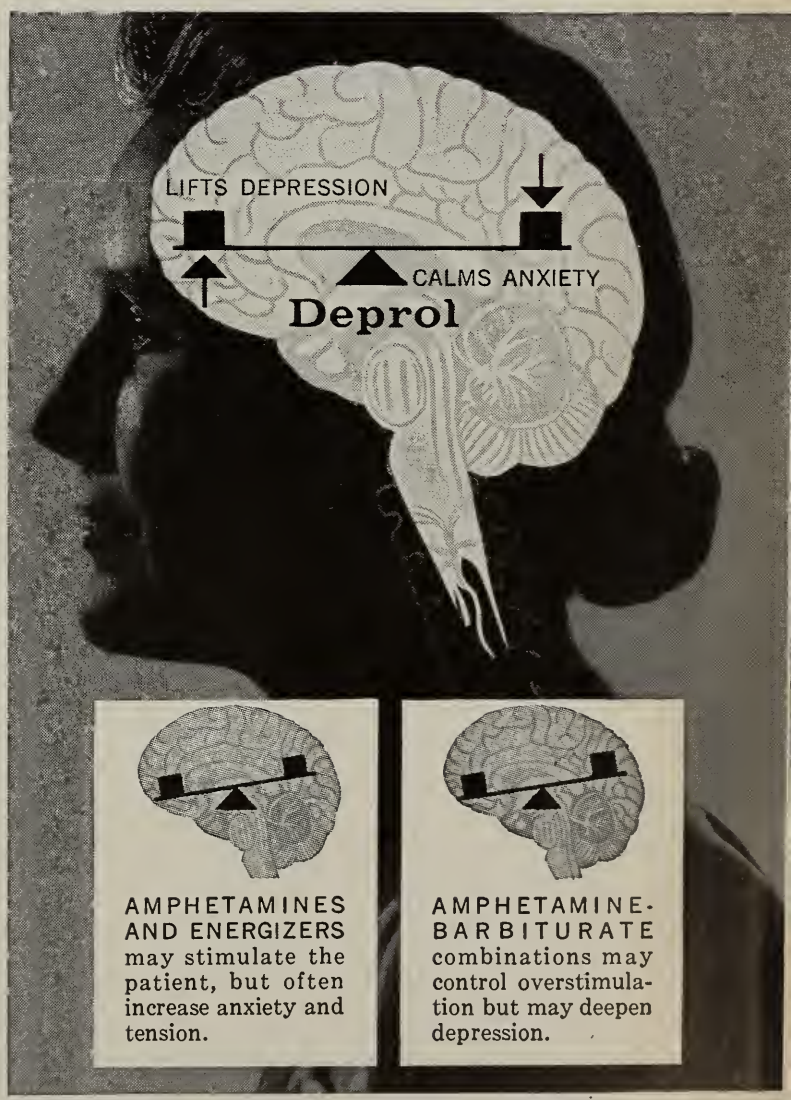
No "seesaw" effect of amphetamine-barbiturates and energizers

While amphetamines and energizers may stimulate the patient—*they often aggravate anxiety and tension.* And although amphetamine-barbiturate combinations may counteract excessive stimulation—*they often deepen depression.*

In contrast to such "seesaw" effects, Deprol lifts depression as it calms anxiety—both at the same time.

Safer choice of medication than untested drugs

Deprol does not produce hypotension, liver damage, psychotic reactions or changes in sexual function.



BIBLIOGRAPHY: **1.** Alexander, L.: Chemotherapy of depression—Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Bateman, J. C. and Carlton, H. N.: Deprol as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy. In press, 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulito, F.: Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresia, G. B.: Treatment of depression—New technics and therapy. Am. Pract. & Digest Treat. In press, 1959. **5.** Pennington, V. M.: Meprobamate-benactyzine (Deprol) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **6.** Rickels, K. and Ewing, J. H.: Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **7.** Ruchwarger, A.: Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **8.** Settel, E.: Treatment of depression in the elderly with a meprobamate-benactyzine hydrochloride combination. Antibiotic Med. & Clin. Therapy. In press, 1959.

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COMPOSITION: 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl) and 400 mg. meprobamate.

SUPPLIED: Bottles of 50 light-pink, scored tablets. Write for literature and samples.

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CD-154

Communications

MINNESOTA HEART ASSOCIATION AND FEDERATED FUNDS

The Minnesota Heart Association always welcomes the careful and critical scrutiny of responsible citizens concerned with the multiplicity of health drives. Our affairs and records are public property, and the expenditure of Heart Fund dollars is prudently directed by unpaid volunteers who serve thousands of hours each year to see that the best results are obtained from each contribution made.

We accept completely the results of the Twin Cities survey carried out by Mid-Continent Surveys, and have no question about its authenticity, accuracy, or integrity. However, we do feel that the depth and scope of the study might have been greater because in our opinion the one crucial question was not asked or answered.

This question is: How can the Minnesota Heart Association, or any other major health agency dealing with a significant health problem, be expected to carry out the public's wishes if such agencies must be included in a federated fund campaign which cuts income at least in half and markedly diminishes the public information phases? The public is asking the Minnesota Heart Association to assume more and more responsibility in the field of heart disease control; physicians are being asked more and more by thoughtful patients when this problem of heart disease will be solved; and in conclusion it appears to us that the public is simply supporting its own interests when it chooses to contribute to the independent Heart Fund. These contributions are not being made to an outside agency, for the Minnesota Heart Association belongs to and is responsible to the public. Contributions are personal investments of individuals who are seeking answers to the baffling questions of heart disease.

It is good to know from the Mid-Continent survey that under our democratic free-choice system 73 per cent of those rendering an opinion said they wished to designate where their gifts are to go. Our country handles in a voluntary fashion many of its problems that other countries solve through government, and this local reflection of our desire to spend our money so it goes to the causes of our own choice represents again a desirable facet of American life, a facet, I am sure, most of us cherish dearly.

The sole purpose of the Minnesota Heart Association is to reduce the appalling toll of death and disability caused by diseases of the heart and blood vessels. We have but one state-wide organization with no formal chapters or affiliates on the local level; we believe this arrangement results in a wiser use of funds raised, a more economical use of limited resources, and reduces our costs of fund raising and administration. Heart disease is this country's number one cause of death, and in fact more Minnesotans die from heart disease than from all other causes combined. Under these circumstances, no thoughtful person can conscientiously lump together the problem of heart disease with the over all multitude of other drives of more limited scope, no matter how worthy they may be.

Placing the Minnesota Heart Association and its research, education, and community service programs within the framework of a Community Chest, United Fund, or other similar federated fund-raising scheme does a distinct disservice to the thousands of volunteers who work faithfully to raise funds. This approach simply postpones the day when eventual scientific break-throughs will come. Our battle is against heart disease; and we know our cause will move ahead more surely and soundly when citizens are free to support the independent Heart Fund as they wish.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

Our experience over several years in Minnesota as a part of Community Chests and United Funds shows without question that our rate of economic growth is far less in federated fund areas than in those areas where contributions are limited only by the generosity of the individual contributor. This situation is not unique to Minnesota because our experience was similar to many other heart associations throughout the country who reported equally unsuccessful participation in Community Chests and United Funds. They too stated that their fund raising remained static while they were a part of federated fund raising, and they too said that their volunteers did not maintain a sense of mission and vigor while part of a federated drive. These experiences directly parallel those of the Minnesota Heart Association. Other heart affiliates also agree that funds available for research to solve the problem of heart disease were materially reduced by such participation. Therefore, in May, 1957, independent of any policy of our parent group, the American Heart Association, our board of directors unanimously voted to end all further participation in federated fund raising. In fact, our association was the first to withdraw on a state-wide basis, and this precedes the present American Heart Association policy in this respect. This decision was reached only after long and mature consideration. Growth of the Heart Fund since this withdrawal has definitely substantiated this action.

Recognizing the importance of this step, our board of directors reviewed the withdrawal policy one year later, and again come to the same conclusion. The decision of the Minnesota Heart Association was made solely upon its own experiences in this state and was in no way influenced or directed by any outside group.

We will continue to rest our case with the contributing public, for under our present policies we cannot participate in any Community Chest or United Fund. We must therefore at the present time decline any invitation, no matter how well intentioned, to be a part of any federated fund campaign anywhere in the state of Minnesota; but this does not mean that we feel other health agencies primarily oriented to direct service programs would not be wise to consider such affiliation with a United Fund.

We are very pleased, however, to be a part of the in-plant employe solicitation in many hundreds of fine Minnesota firms. This is called a "United Appeal" and must be clearly distinguished from "United Fund" which is a community-wide federated drive. We participate when the United Appeal is conducted under the following conditions: (a) they are entirely voluntary; (b) the agencies are listed separately so that the giver may exercise his or her option to designate the recipient of his or her gift; (c) the right of the employe to give or not to give is maintained, and (d) if adequate and

(Continued on Page A-80)

A single 5 mg. tablet once a day provides all these advantages[2]

- prolonged action — in excess of 18 hours
- convenient once-a-day dosage
- low daily dosage — more economical for the patient
- no significant alteration in normal electrolyte excretion pattern
- repetitively effective as a diuretic and antihypertensive
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- in hypertension, Naturetin, alone or in combination with other antihypertensives, produces significant decreases in mean blood pressure and other favorable clinical effects
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- allergic reactions rarely observed

[2]Reports (1959) to the Squibb Institute for Medical Research.

Naturētin —*Indications:* in control of edema when diuresis is required, in congestive heart failure, in the premenstrual syndrome, nephrosis and nephritis, cirrhosis with ascites, edema induced by drugs (certain steroids); in the management of hypertension, used alone, combined with Raudixin (Squibb Rauwolfia Serpentina Whole Root), or with other antihypertensive drugs, such as ganglionic blocking agents.

Contraindications: none, except in complete renal shutdown.

Precautions: when Naturetin is added to an antihypertensive regimen including hydralazine, veratrum, and/or ganglionic blocking agents, immediate reduction must be made in the dosage for all preparations; the dosage for ganglionic blocking agents must be decreased by 50% to avoid a precipitous drop in blood pressure. This also applies if these hypotensive drugs are added to an established Naturetin regimen . . . in hypochloremic alkalosis with or without hypokalemia . . . in cirrhotic patients or those on digitalis therapy when reductions in serum potassium are noted . . . in diabetic patients or those predisposed to diabetes . . . when increased uric acid concentrations are noted . . . when signs—leg or abdominal cramps, pruritus, paresthesia, rash—suggestive of hypersensitivity, are noted.

Naturētin —*Dosage: in edema,* average dose, 5 mg., once daily, preferably in the morning; to initiate therapy, up to 20 mg., once daily or in divided doses; for maintenance, 2.5 to 5.0 mg., daily in a single dose. *In hypertension:* suggested initial dose, 5 to 20 mg. daily; for maintenance, 2.5 to 15 mg. daily, depending on the individual response of the patient. When Naturetin is added to an antihypertensive regimen with other agents, lower maintenance doses of each drug should be used.

Naturētin —*Supplied:* tablets of 2.5 mg. and 5 mg. (scored).

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MINNESOTA HEART ASSOCIATION

(Continued from Page A-76)

reasonable provision is made for the conduct of educational programs by the Heart Association.

The public knows our association's principal objective is the support of long-term research into the causes and cures of heart disease; it knows of our extensive professional and public education programs; it knows of our expanding community service activities; and we rest our case, as ultimately every group must do under our democratic system, in the hands of the individual. We are confident that the citizens of Ramsey and Hennepin counties, and other counties throughout our state, will continue to support our work generously because they know of our program and our needs.

It is our sincere hope that this public discussion of the merits of federated fund raising versus independent fund raising will not create such differences of opinions that the total level of giving in our communities will decline. We are fully aware of the importance of proper support for purely local needs and in fact many of our most dedicated volunteers have been and will continue to be devoted supporters and solicitors for these very worthy causes. However, the Minnesota Heart Association will not evade its responsibility to the thousands of Minnesotans who are today afflicted with heart disease, nor will we contribute to any unwarranted delay in accomplishing our objective of an early victory over heart disease by participating in federated fund raising. Time is indeed running out for thousands of our friends and relatives who face an untimely end from heart disease.

Richard J. Rothmund
Minnesota Heart Association

Saint Paul, Minnesota
November 10, 1959

COMMUNITY CANCER DEMONSTRATION PROJECTS

Nine grants totaling $321,894 have been awarded by the Public Health Service to support Community Cancer Demonstration Projects.

Ranging in location from Hawaii to Puerto Rico, the nine projects were recommended for approval by the Advisory Committee to the Cancer Control Program, and the National Advisory Cancer Council. Five of the projects will deal with tumor records and registries, two will screen large numbers of women for cancer of the cervix, and two will further education in cytology, the science of cells.

Purpose of the studies financed by the grants is to shorten the interval between discoveries in research and the application of these findings at the community level, the Surgeon General said. They are the first to be assigned from the $1,500,000 appropriated by Congress for this purpose during the current fiscal year.

The Cancer Control Program, within the Division of Special Health Services, Public Health Service, is administering the fund, and is receiving applications from health agencies and nonprofit organizations and institutions. Additional projects will be approved next spring and summer.

Among the specific opportunities believed to exist for the prevention and control of cancer are professional and technical education in cytology, screening women for cervical cancer, the importance of including cancer diagnostic aids in complete health examinations, evaluation of public educational activities, tumor registries collecting data of exceptional value, and selected therapeutic and rehabilitative programs.

Leroy E. Burney, M.D.
U. S. Department of Health, Education and Welfare

Washington, D. C.
December 30, 1959

Annual Clinical Conference

CHICAGO MEDICAL SOCIETY

March 1, 2, 3 and 4, 1960

Palmer House, Chicago

Daily Half-Hour Lectures by Outstanding Teachers and Speakers on subjects of interest to both general practitioner and specialist.

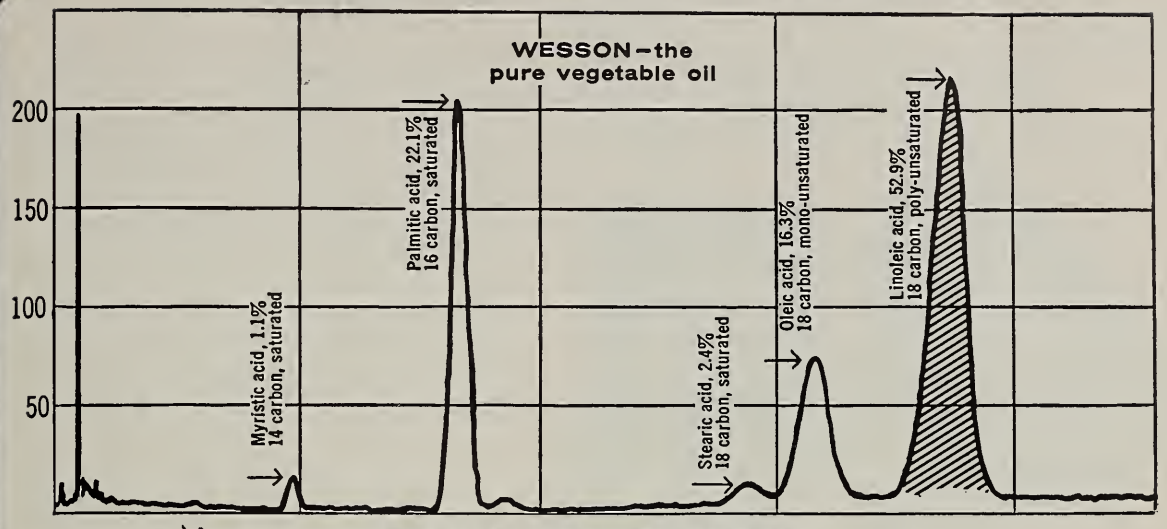
Panels on Timely Topics — **Teaching Demonstrations**

Medical Color Telecasts — **Instructional Courses**

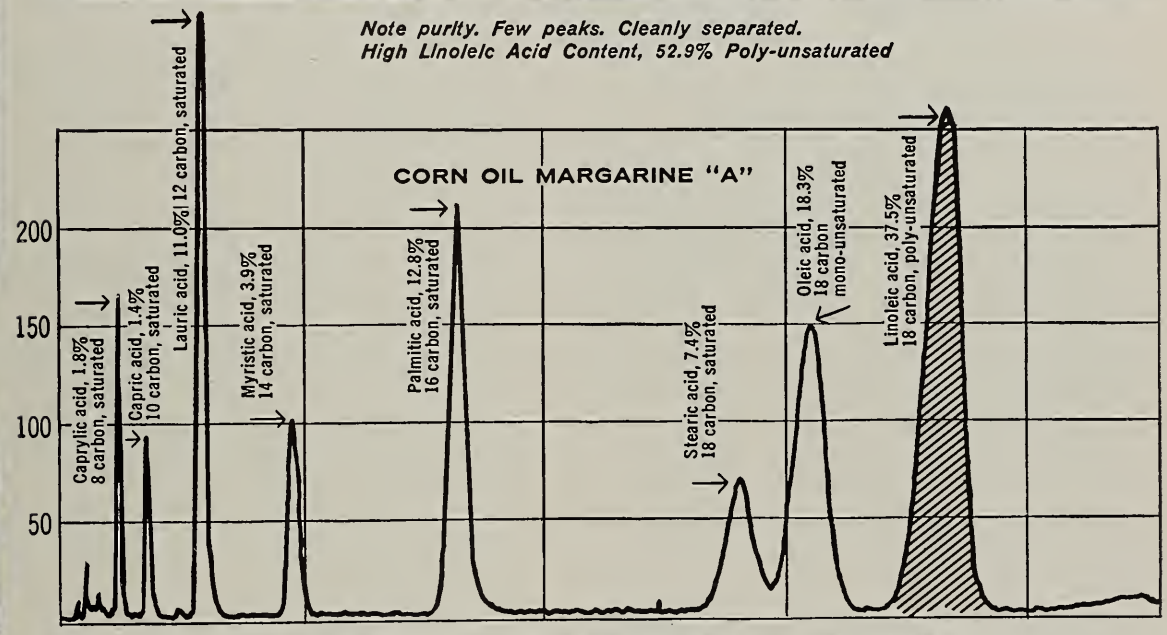
Scientific Exhibits worthy of real study and helpful and time-saving Technical Exhibits.

The Chicago Medical Society Annual Clinical Conference should be a MUST on the calendar of every physician. Plan now to attend and make your reservations at the Palmer House.

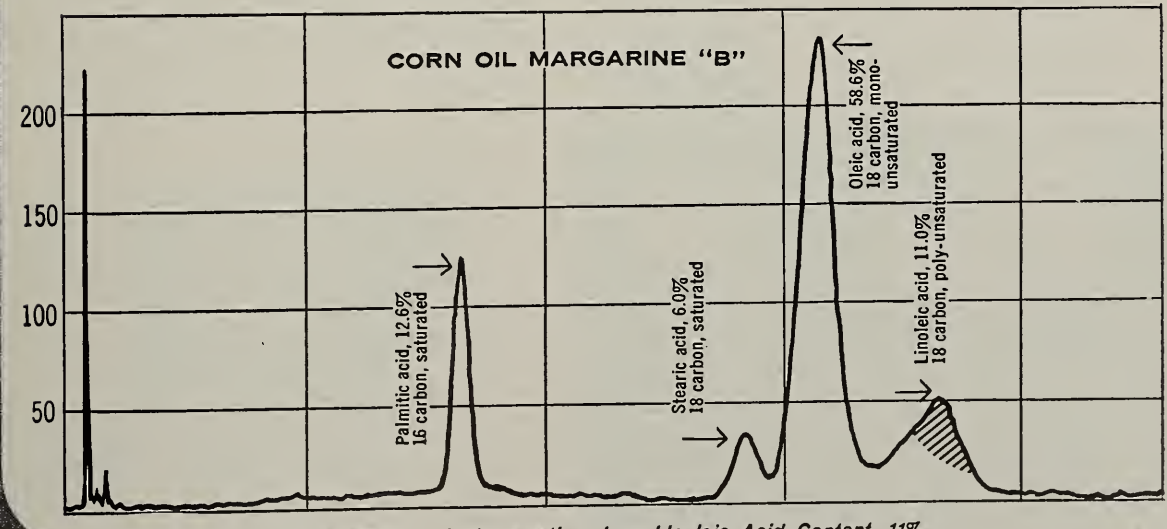
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In Memoriam

OSCAR DAIGNAULT

Dr. Oscar Daignault, physician and surgeon in Benson, Minnesota, from 1900 to 1948, died November 18. 1959. The deceased was eighty-four years old at the time of his death. He had retired from active practice in May, 1948, due to failing health.

Doctor Daignault was born in Montreal. Canada. where he also received his preliminary education. He obtained his medical education at the University of Montreal Medical School, a branch of Laval University. Following graduation he practiced for a short time in Saint Paul before moving to Benson.

The deceased was a member of the Kandiyohi-Swift-Meeker County Medical Society and the American Medical Association. He was a life member of the Minnesota State Medical Association.

Survivors include his wife, Grace; one son, Rene, of California, and three sisters, Mrs. Alice Laperrie, Mrs. Lydia DeMarce, and Georgette Daignault, all of Montreal, Canada.

JOHN E. HYNES

Doctor John E. Hynes, who practiced medicine at S.E. Bedford and University Avenues, Minneapolis. for more than fifty-four years, died December 9, 1959, at the age of eighty-one.

The deceased was born in Winnebago, Minnesota, and received his preliminary education in the public schools of that community. His medical education was obtained at the University of Minnesota. He served on the staff of Saint Mary's Hospital, Minneapolis, and was chief of staff of that hospital.

Doctor Hynes was a member of the Hennepin County Medical Society and a life member of the Minnesota State Medical Association.

In addition, he was a member of the Minnesota Academy of Medicine in which he had been president and secretary-treasurer, and he was active in the Republican Party politics.

Survivors include a daughter, Mrs. Franklin G. Wallace, Mound; a son, Doctor John E. Hynes, Jr., Billings, Montana, and a brother Joseph, Winnebago, Minnesota.

MELVIN S. NELSON

Dr. Melvin S. Nelson, Granite Falls physician, died November 10, 1959, at the age of seventy-six years.

The deceased was prominent in community affairs of Granite Falls during the major portion of his life. He served as an active member of the Granite Falls School Board and was a past president of the Granite Falls Golf Club for a number of years.

Doctor and Mrs. Nelson established the first Granite Falls Hospital shortly after their arrival in that community. When Granite Falls built the present hospital, Doctor and Mrs. Nelson donated their own hospital building and property and equipment to the Granite Falls community as a gift.

Doctor Nelson was born in Appleton, Minnesota. He received his medical education at the University of Minnesota Medical School. Before his practice in Granite Falls, Doctor Nelson practiced from 1909 to 1914 in Mora, Minnesota, and from 1914 to 1924 in Spring Grove, Minnesota.

Some of the positions held by Doctor Nelson include membership of the Mora hospital staff, membership of the Spring Grove hospital staff and membership of the Granite Falls hospital staff. He was also affiliated with the United States Army Debarcation Hospital in New York for one year.

Doctor Nelson was granted life membership in the Minnesota State Medical Association in 1959, and he was a member of the Camp Release Medical Society and the American Medical Association.

ROBERT I. RIZER

Dr. Robert I. Rizer, Minneapolis internist, died November 13, 1959, at seventy-six years of age.

The deceased began his practice of Internal Medicine in 1915 in Minneapolis and retired in 1956.

A native of Boone, Iowa, Doctor Rizer graduated from the University of Chicago and Rush Medical School, Chicago. Before coming to Minneapolis, he studied in Vienna.

After graduation, he practiced medicine for three years in Anaconda, Montana, from 1910 to 1913.

He was on the staff of Northwestern Hospital and was a clinical associate professor of internal medicine at the University of Minnesota.

Doctor Rizer was a member of the American Board of Internal Medicine, the Minneapolis and Minnesota societies of Internal Medicine, the Minneapolis Club and Nu Sigma Nu professional fraternity.

In 1955, Doctor Rizer was granted life membership in the Minnesota State Medical Association. He was also a member of the Hennepin County Medical Society and the American Medical Association.

Survivors include his wife, Grace R.; two daughters, Mrs. Frederick Paffard, Sewickley, Pennsylvania, and Mrs. Howard Rue, Philadelphia, Pennsylvania; and two sons, Dr. Dean K., Wayzata, and Robert I., Jr., of Mound.



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The Physician's Diary

Dr. Robert B. Howard, Dean of the Medical School, University of Minnesota, and **Dr. Richard Magraw,** Assistant Dean, were guest speakers at the recent meeting of the Brown County Medical Association. Auxiliary members were entertained at the home of **Dr.** and Mrs. **E. L. Penk,** Springfield.

* * *

The Board of Governors of the Mayo Clinic has confirmed the election of **Dr. O. H. Beahrs** to fill the unexpired term of **Dr. Waltman Walters,** who retired from the Board.

* * *

Members of the Southwestern Minnesota Medical Society heard the purposes and objectives of the new three-county Mental Health Clinic at Worthington recently. Guest speakers at the meeting were a clinical psychologist and a psychiatric social worker from Luverne. Auxiliary guests were entertained at the home of **Dr.** and Mrs. **John Lohmann,** Worthington.

* * *

The new members of the Mayo Clinic staff include the following: **Dr. J. T. Martin,** consultant in section of anesthesiology; **Dr. C. G. Moertel,** consultant in section of medicine; **Dr. P. J. Osmundson,** consultant in section of medicine; **Dr. C. A. Pascuzzi,** consultant in section of clinical pathology; **Dr. L. F. A. Peterson,** consultant in section of orthopedic surgery; **Dr. G. E. Plum,** consultant in section of diagnostic roentgenology; **Dr. Alexander Schirger,** consultant in section of medicine; **Dr. R. E. Smith,** consultant in section of medicine; **Dr. R. J. Spencer,** consultant in section of proctology; **Dr. R. M. Steinhilber,** consultant in section of psychiatry; **Dr. W. N. Tauxe,** consultant in section of clinical pathology; and **Dr. J. W. Worthington, Jr.,** consultant in section of medicine.

* * *

Dr. Dale C. Cameron, State Medical Director, has announced his resignation from that post effective January 31. Doctor Cameron plans to accept a position with the Federal Public Health Service. A successor to Doctor Cameron has not yet been named. Members of the Mental Health Policy Committee which will aid in the selection of a successor include **Dr. Bernard C. Glueck, Jr.,** University of Minnesota; **Dr. Samuel Boyer,** Duluth, and **Dr. John Anderson,** University of Minnesota.

* * *

Retiring members of the Mayo Clinic staff were honored at the annual meeting of that association. They include: **Dr. J. A. Bargen,** chairman of the section of gastroenterology; **Dr. J. S. Lundy,** senior consultant in and former head of the section of anesthesiology, and **Dr. Hamilton Montgomery,** senior consultant in dermatology.

* * *

Dr. Frederick C. Goetz, University of Minnesota, was chairman of a diabetes detection drive in the Twin Cities recently. **Dr. Philip Soucheray,** St. Paul, and **Dr. Moses Barron,** Minneapolis, were captains of their respective cities. The drive was aimed at alerting the public to the importance of taking a simple test for diabetes.

* * *

A former member of the Mayo Clinic staff and emeritus professor of medicine in the Mayo Foundation, Graduate School, **Dr. Walter C. Alvarez** was given an award recently by the New York City Chapter of the American Medical Writers' Association for distinguished service in the improvement of medical communication. Ceremonies took place at the New York University School of Dentistry in Manhattan.

* * *

Dr. M. H. Larson, who maintained a medical practice in Lake Benton for the past six and one-half years, recently resigned that position and accepted a position on the staff of the Minnesota State Hospital at St. Peter.

* * *

Among members of the Mayo Clinic staff who attended recent medical meetings were: **Drs. R. W. P. Achor, E. D. Bayrd, K. G. Berge, J. L. Juergens, H. R. Butt, H. M. Carryer, D. C. Connolly, M. B. Divertie, W. T. Foulk, E. E. Gambill, G. A. Hallenbeck, N. G. Hepper, J. A. Higgins, K. A. Huizenga, F. T. Maher, R. D. Miller, D. R. Nichols, C. A. Owen, T. W. Parkin, H. F. Polley, W. G. Sauer, H. H. Scudamore, C. H. Scheifley, R. E. Smith, M. H. Stauffer, L. E. Ward** and **C. H. Watkins.**

* * *

Dr. O. J. Seifert, New Ulm, recently announced the addition of a new physician on the Seifert Clinic staff. Starting recently was **Doctor John H. Baker,** a native of Uxbridge, Massachusetts.

* * *

Duluth physician, **Dr. William B. Martin,** recently directed a diabetes campaign in the Duluth area. **Dr. James C. Trautmann,** also of Duluth, assisted Doctor Martin in the drive.

* * *

Dr. Edgar V. N. Allen, Rochester, was awarded the 1959 Gold Heart Award of the American Heart Association. Doctor Allen was one of three receiving awards for outstanding contributions to cardiovascular medicine.

* * *

A Hibbing surgeon, **Dr. L. W. Johnsrud,** was a guest speaker at a meeting of the Saturday Club of Hibbing. Doctor Johnsrud spoke on "Medical Education in the United States Today." Following his talk, Doctor Johnsrud presented a film entitled, "Hands We Trust."

* * *

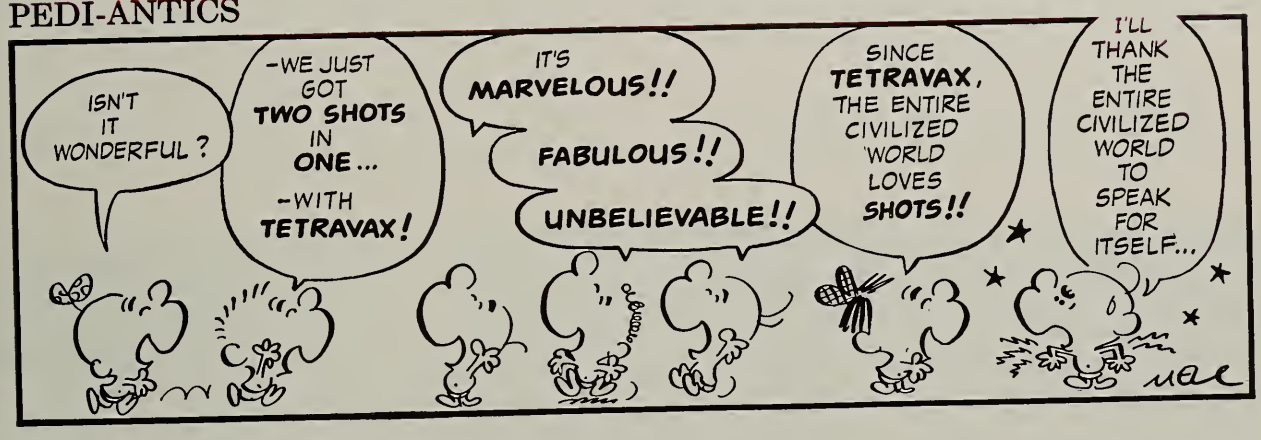
The White House recently announced the appointment of **Dr. Winchell McK. Craig,** emeritus member of the Mayo Clinic Staff, as Special Assistant for health

(Continued on Page A-96)

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(Continued from Page A-90)

and medical affairs to the Secretary of Health, Education and Welfare. The internationally recognized neurosurgeon will be a policy adviser to Secretary Arthur S. Flemming.

* * *

Dr. Warren E. Wilson, Northfield, recently suffered a heart attack while attending a medical meeting in Chicago. Doctor Wilson was hospitalized there at St. Luke's Presbyterian Hospital for a short while.

* * *

A medical exhibit by four members of the staff of the Mayo Clinic received the first place award at the International Medical Assembly of the Interstate Postgraduate Medical Association of North America. The award was given to the exhibit "Misleading Calcific Shadows in the Abdomen" by **Drs. L. G. Bartholomew, J. C. Cain, G. D. Davis** and **A. H. Bulbulian.**

* * *

Guest speakers for the Fall Seminar of the Range Chapter of the American Academy of General Practice included **Dr. Neil Palm,** Saint Paul, Surgeon; **Dr. Harold Ravits,** Saint Paul, Dermatologist, and **Dr. Tague Chisholm,** Minneapolis, Pediatric Surgeon.

* * *

Dr. Edward A. Banner, Rochester, has been elected president of the Minnesota Obstetrical and Gynecological Society at the Society's Annual Convention. Other officers elected include **Dr. Charles McKenzie,** Minneapolis, Vice President; **Dr. Alex Barno,** Minneapolis, Secretary-Treasurer and **Dr. Jane Hodgson** to the Board of Governors.

* * *

The new office building of **Dr. John J. Smyth,** Lester Prairie, recently went into use. The building is a new block and brick structure.

* * *

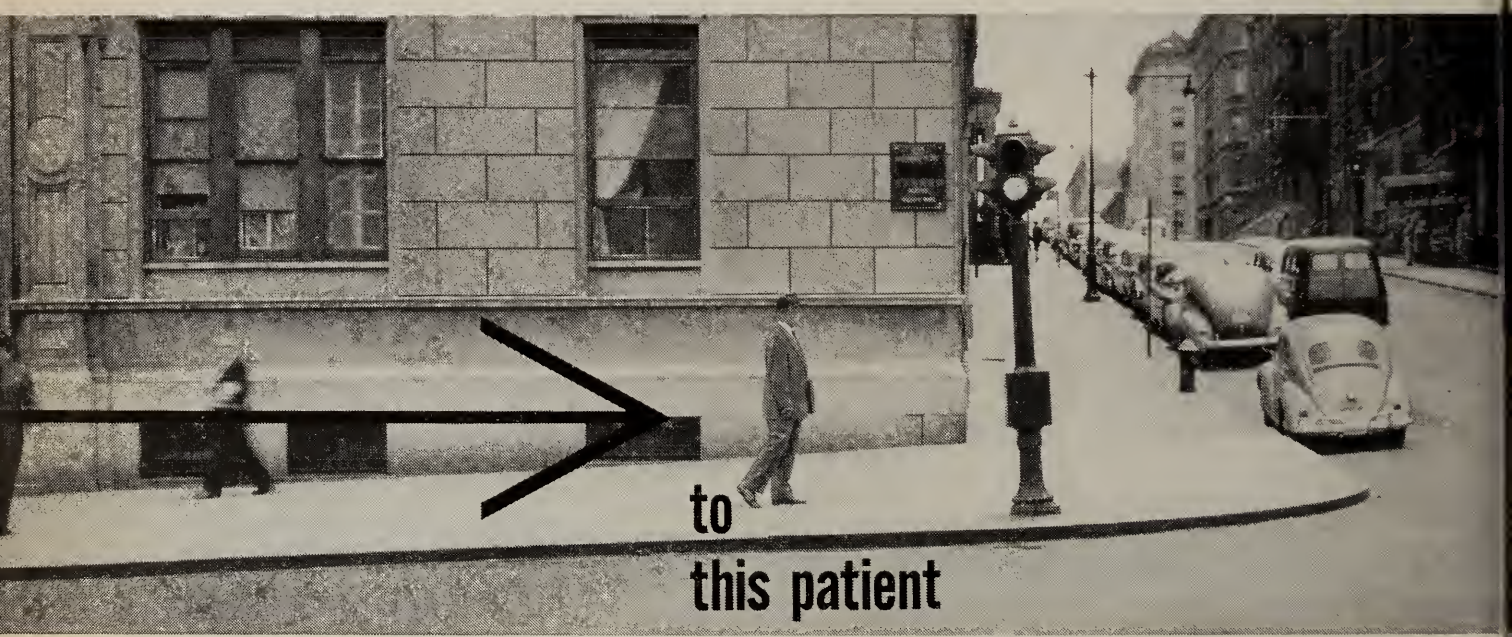
The American Academy of Pediatrics recently elected **Dr. William H. Weidman,** Rochester, to membership in the specialty section on Cardiology. Doctor Weidman is a member of the postgraduate section on the heart, designed for scientific study in the practice of infants, children and adolescents.

* * *

Dr. Robert B. Howard, Dean of the University of Minnesota Medical School, had the honor of accepting a sixty-pound plaque from the National University College of Medicine in Seoul, Korea. The award was made in appreciation of work done by the staff of the University Medical School in rehabilitation of the war-torn Seoul University College of Medicine.

* * *

Dr. John Gordon, University of Minnesota, was a recent guest speaker at a meeting of the Red River Valley Medical Society held in Crookston. Doctor Gordon based his talk on problems in anesthesia.



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Dr. Duane C. Olson, Gaylord, recently announced the sale of the Olson Clinic in Gaylord to **Dr. Harvey A. Knoche, Morgan.** Doctor Olson will join the medical offices of **Drs. Hagen** and **Hodges** in the Southdale Medical Center, Minneapolis.

* * *

Recipients of awards given at the thirty-fifth annual meeting of the Alumni Association of the Mayo Foundation were **Dr. Philip J. Osmundson** and **Dr. John W. Worthington,** Mayo Clinic. Doctor Osmundson received the Edward John Noble Foundation award and Doctor Worthington the Herschel V. Jones award. At the same meeting, **Dr. L. Raymond Scherer,** Minneapolis, was elected first vice president of the Association.

* * *

A recent speaker at a meeting of the American Association of University Women was **Dr. Bernard J. Spencer,** Minneapolis. Doctor Spencer spoke on "The Child and the Surgeon."

* * *

A two-day conference on Neurosurgery was held in honor of **Dr. William T. Peyton,** University of Minnesota. Doctor Peyton is Head of the University of Minnesota Division of Neurosurgery.

* * *

Dr. Robert Bloomberg, Austin, has been appointed program director of the Mower County Mental Health Clinic. Doctor Bloomberg succeeds **Dr. Carl A. Schwartz.**

* * *

The Elk River Clinic recently announced the addition of **Dr. Jo E. Anderson** to the Clinic staff.

* * *

The Duluth unit of the American Cancer Society recently elected Dr. **Philip F. Eckman,** Duluth, as president. Also elected were **Dr. Kenneth A. Storsteen,** vice president; and **Dr. Mario Fischer** to the executive committee.

* * *

Dr. George R. McNear, Jr., Mankato Clinic, has been selected to participate in the International Symposium on Scientific Medicine sponsored by the Society of Scientific Medicine of Lisbon.

* * *

It has recently been learned that **Dr. Walter A. Fansler,** emeritus clinical professor of surgery, University of Minnesota, has been appointed on the ad hoc Advisory Committee on Cancer of the Colon and Rectum of the American Cancer Society.

* * *

Dr. Katherine Nye and **Dr. Jane Hodgson,** St. Paul physicians, recently received citations for their work in the field of medicine. They were among ten St.



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Paul women cited at a luncheon and program observing National Business Women's Week.

* * *

The Osakis Review recently announced that **Dr. E. Haberman**, of that town, was retiring. Doctor Haberman has served the town of Osakis for forty-three years in the practice of medicine.

* * *

Alexandria physician, **Dr. D. E. Perkins**, recently attended a course in clinical cardiology at the Cook County Graduate School of Medicine in Chicago.

* * *

A recent lecture marked the first use of the Kirklin-Weber Memorial Fund, honoring the memory of two former chiefs of Mayo Clinic are **Dr. Byrl R. Kirklin** and **Dr. Harry M. Weber.** The guest speaker was **Dr. Leo G. Rigler**, former Professor of Radiology at the University of Minnesota and now Executive Director of the Cedars of Lebanon Hospital, Los Angeles, California.

* * *

Announcement was made recently of the new officers of the Minneapolis Obstetrical and Gynecological Society. The elected officers are: **Dr. Maxwell Barr**, president; **Dr. George Janda**, vice president, and **Dr. Richard Fliehr**, secretary-treasurer.

* * *

The Duluth Unit of the American Cancer Society recently named **Dr. Philip F. Eckman** as president and **Dr. Kenneth E. Storsteen** as vice president.

An emeritus member of the Mayo Clinic Staff, **Dr. S. W. Harrington**, recently returned from a trip to the Middle East and Europe. While abroad, Doctor Harrington attended medical meetings in Munich and Vienna, and also visited Switzerland, Yugoslavia, Greece, Turkey and the city of Jerusalem before visiting Rome.

* * *

Duluth physicians, **Dr. Andrew Reardon** and **Dr. Henry Reed**, were recently certified by the American Board of Pediatrics.

* * *

Dr. Lester N. Dale, Red Lake Falls, recently announced that **Dr. Walter E. Miller** will be associated with him in the practice of medicine for a short time.

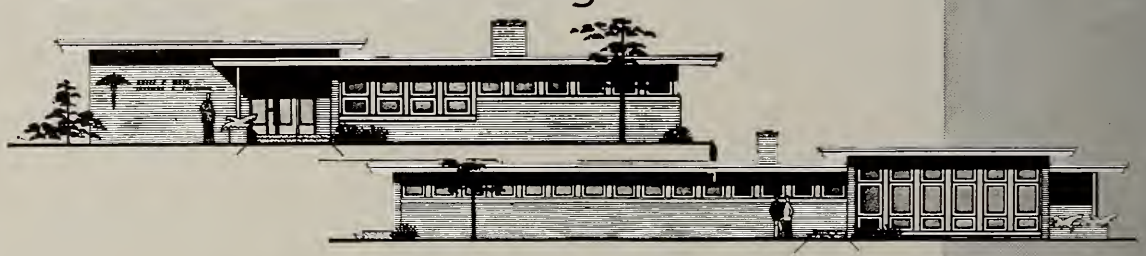
* * *

Dr. Charles W. Mayo and **Dr. Philip Hench**, Rochester, have returned from Omaha, Nebraska, where they attended the annual presentation of the Mutual of Omaha Criss Award. Doctor Mayo is head of the award committee and Doctor Hench is a previous recipient of the award. This year's award went to **Dr. Thomas A. Dooley** of Laos.

* * *

Dr. Robert B. Howard, Dean of the University of Minnesota Medical School, was a guest speaker at a recent meeting of the Minnesota Chapter of the Arthritis and Rheumatism Foundation. Doctor Howard's talk was on "The Public's Stake in Medical Education and Research."

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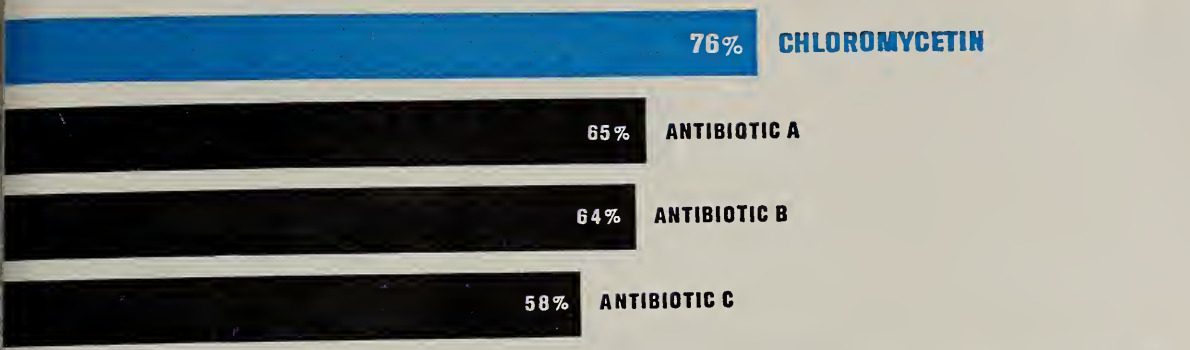
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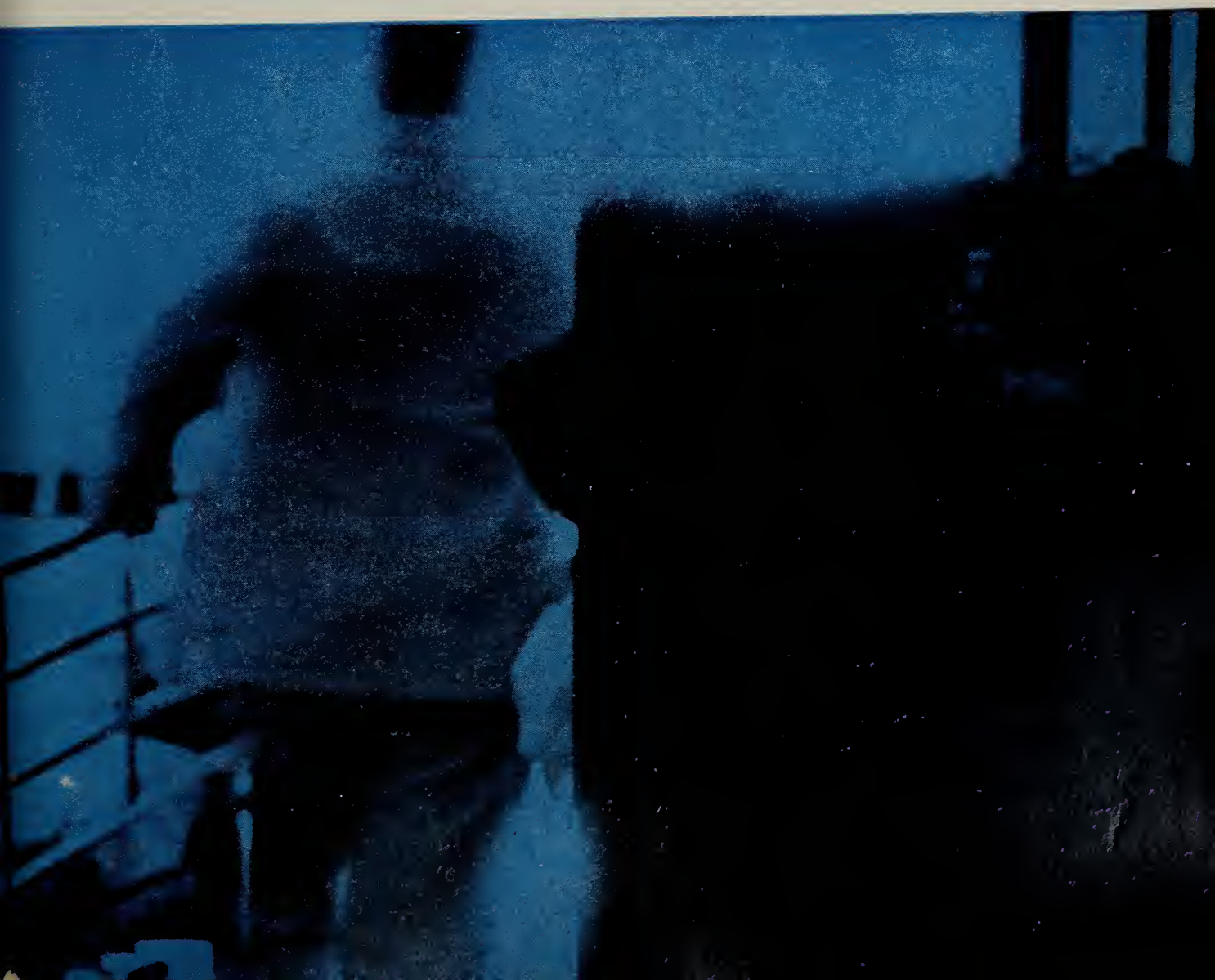


REFERENCES: (1) Leming, B. H., Jr., & Flanigan, C., Jr., in Welch, H., & Marti-Ibânez, F.: Antibiotics Annual 1958-1959, New York, Medical Encyclopedia, Inc., 1959, p. 414. (2) Goslings, W. R. O., & Buchli, K.: *Arch. Int. Med.* 102:691, 1958. (3) Suter, L. S., & Ulrich, E. W.: *Antibiotics & Chemother.* 9:38, 1959. (4) Metzger, W. I., in Welch, H., & Marti-Ibânez, F.: Antibiotics Annual 1958-1959, New York, Medical Encyclopedia, Inc., 1959, p. 966. (5) Fischer, H. G.: *Deutsche med. Wchnschr.* 84:257, 1959. (6) Borchardt, K. A.: *Antibiotics & Chemother.* 8:564, 1958. (7) Schneierson, S. S.: *J. Mt. Sinai Hosp. New York* 25:52, 1958. (8) Waisbren, B. A.: *Wisconsin M. J.* 57:89, 1958.

*Adapted from Leming & Flanigan.[1]

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Juvenile Delinquency

A Panel Discussion

It is hoped that this panel on juvenile delinquency will stimulate more thought and study on the primary causes of a nationwide problem.

HAROLD F. FLANAGAN, M.D., Moderator
JOHN K. DONOHUE, M.A.
HYMAN S. LIPPMAN, M.D.
LEONARD P. COWLEY, D.D., LL.D.

Presented at the Minnesota Academy of Medicine Meeting, Saint Paul, Minnesota, May 13, 1959.

WE are fortunate to have as members of our panel, men who have devoted much thought and time to a study of human behavior. They are particularly interested in the behavior of the child, adolescent, and young adult.

Mr. John Donohue, a man who for many years has had the responsibility of guiding, counseling, advising, and, if necessary, threatening those juveniles charged to him and his associates for rehabilitation by the Juvenile Court. His work as Chief Probation Officer of Ramsey County has been nationally recognized. He is the author of a text on juvenile delinquency, "Baffling Eyes of Youth," which was published by the Associated Press in 1957, and received the Leadership Award.

Dr. Hyman Lippman is a child psychiatrist who has probably worked with more problem children than any physician in the state. He is nationally recognized as a leader in child guidance. He is the director of the Wilder Child Guidance Clinic in Saint Paul, and Clinical Professor of the Department of Psychiatry and Department of Pediatrics at the University of Minnesota Medical School. He, too, is an author. His book, "The Treatment of the Child in Emotional Conflict," published by McGraw and Hill in 1956 has met with very favorable reception.

Bishop Leonard P. Cowley, the third member of our panel, has always had a great interest in the behavior of the child, especially the child during the adolescent age and young adulthood. He is a graduate of St. Thomas College, the St. Paul Seminary, and was a parish priest at St. Andrew's in St. Paul. Because of his interest in, and ability to work with youth, he was selected by the late Archbishop Murray to become the director of the Newman Foundation at the University of Minnesota. He was made pastor of St. Olaf's Parish in Minneapolis so he could be closer to his work at the University. His work here was so outstanding that it was only natural when a new Auxiliary Bishop to the diocese of Saint Paul was occasioned by the transfer of Bishop Byrne, he was selected for this honor.

Introduction

HAROLD F. FLANAGAN, M.D.
Saint Paul, Minnesota

The newspapers, the magazines, radio, and television constantly remind us of the abnormal behavior of our youth. Pediatric, psychiatric, and sociologic journals, in almost every issue, remind us of the importance of this subject with articles on the cause, symptoms, and treatment of juvenile delinquency. A discussion of this subject by those as well qualified as our guest speakers, seems timely.

On a panel discussion such as this, it is advisable to define our subject. For the purpose of our discussion, *juvenile delinquency* is that status of a boy or girl, under the age of eighteen, coming into contact with the law because of act or acts of deviant behavior against society. Delinquency can, and does, vary in severity and duration.

The term *delinquency* is not a pathologic or psychiatric term, but a sociologic one. In the lower socio-economic level, the term (as defined in the previous paragraph) is almost always used correctly. In the upper-middle, and upper-class social levels, the term *mentally disturbed child* is frequently substituted for *delinquent child.* In these cases the child is referred to a psychiatrist or to a school for disturbed children for therapy, and not taken through juvenile court. Since delinquency is a symptom and not a disease, we must consider what produces normal, as well as abnormal, behavior. The four institutions that play the major role in developing our emotional and social life, and are responsible for setting what standards of behavior we have are: (1) the home and its immediate environment, (2) the school, (3) the church, and (4) the state.

The first scientific study on the social cause of juvenile delinquency, was done in 1950 by Sheldon and Eleanor Glueck[1] of the Harvard School of Law. They studied several hundred boys from an institution, and using an equal number as a control, developed a classification of the social factors that are responsible for delinquency. With this classification, they were able to predict successfully a certain group of children who have as much as a 90 per cent chance of being delinquent, and by the same token, it was possible to predict those with a 90 per cent chance of improving their behavior.

The following is a copy of the Social Prediction Table as outlined by Dr. Preston McClendon.[2]

SOCIAL FACTOR PREDICTION TABLE

1.	*Discipline of Boy by Father*	
	Overstrict or erratic	71.8
	Lax	59.8
	Firm but kindly	9.3
2.	*Supervision of Boy by Mother*	
	Unsuitable	83.2
	Fair	57.2
	Close or suitable	9.9
3.	*Affection of Father for Boy*	
	Indifferent or hostile	75.9
	Warm (including overprotective)	33.8
4.	*Affection of Mother for Boy*	
	Indifferent or hostile	86.2
	Warm (including overprotective)	43.1
5.	*Cohesiveness of Family*	
	Unintegrated	96.9
	Some element of cohesion	61.3
	Cohesive	20.6

Discipline of Boy by Father.—

Overstrict or erratic: Father is harsh and unreasoning, demands obedience through fear, is not consistent in control.

Lax: Father is negligent and indifferent, lets boy do as he likes, or boy has not lived with his father at all.

Firm but kindly: Discipline based on sound reasoning which boy understands and accepts as fair.

Supervision of Boy by Mother.—

Unsuitable: Mother is careless, leaving boy to his own devices or in care of an irresponsible child or adult.

Fair: Mother, though home, gives or provides only partial care to boy.

Close: If mother does not work or is not ill, she personally keeps close watch on boy. If she works or is out of the home through illness, there is a responsible adult in charge.

Affection of Father and Mother for Boy.—

Indifferent: Parent does not pay much attention to boy, but is not outwardly hostile.

Hostile: Parent obviously rejects child.

Warm: Parent is outwardly sympathetic, kind, attached, even though in some cases overly protective.

Cohesiveness of Family.—

Unintegrated: Home is just a place to "hang your hat"; self-interest of members exceeds group interest. This applies especially to parents and older siblings.

Some elements of cohesion: Even if family group is not entirely intact (because of departure of one or more members for purely selfish reason) the remaining group has at least some of the characteristics of the cohesive family.

Cohesive: There is a strong "we" feeling among members; there is pride in the home. This applies even if the parent has never been a part (usually the father).

This prediction table shows in graphic detail the importance the home and the "child-parental" relationship has on behavior.

Dr. Adelaide Johnson[3] and others have introduced, through their correlated studies of parents and children, an extremely important concept of the etiology of juvenile delinquency. In many cases the child is only acting out unconsciously the unconscious impulses of the parent, with mutual gratification. There would appear to be another group of delinquents who are more consciously aware of the delinquent impulses of their parents. The impulses being revealed through parental behavior or repetitive stories related by the parent of their own or other's delinquent behavior.

Redl[4] has given us what appears to be our best sub-group classification. He describes four fundamentally different types of juvenile delinquency:

1. Basically healthy individuals whose delinquent behavior is a natural defense against wrong handling, a wrong setting in which to live, or against traumatic experiences of certain types.

2. Basically non-delinquent youngsters who are drifting into delinquent behavior on the basis of more acute adolescent growth confusion.

3. Delinquencies which are really on a neurotic basis, delinquent behavior as part of a neurosis or developed to disguise one.

4. Genuine delinquency—certain disturbances in the impulsive system of the individual, and/or malformation of ego, super-ego, ego ideal, in intensity or content.

Physicians generally have been slow in recognizing this important problem. All reports show the incidence increasing not only in frequency, but in the severity of acts committed against society. From 1948 to 1951 there was a 19 per cent increase in cases handled by the Juvenile Courts.

Those of us in pediatrics have been more aware of this condition than most of our colleagues, except the psychiatrist. The Academy of Pediatrics, six years ago set up a national committee under the chairmanship of Dr. Preston McClendon, to co-operate and work with ancillary groups in attacking this problem. Most state chapters of the Academy have local committees. For the Minnesota Chapter, Dr. Albert Shroeder is the chairman of the committee.

Some physicians doubt if juvenile delinquency is a medical problem. I am sure that those of us in the private practice of pediatrics, and those in general practice who work with children, recognize the importance of a knowledge of abnormal behavior patterns. The advances made in infant feeding in the past twenty years have reduced this from a major to a minor role in child care. But the increasing incidence of emotionally disturbed and delinquent children has shown us that we are neglecting a most important role in child development.

The pediatrician has not only the opportunity, but the duty to teach a healthy "child-parental" relationship beginning with his first examination of the newborn infant. The mother should be assured that she has the ability to care for her infant. She should be encouraged and advised to talk over problems that arise in the behavior of her child as freely as she reports on skin irritations or upper respiratory infections. The child's attitude may be as important as allergic symptoms. If the child has a physical handicap this should be discussed freely and completely with the parents, and with the child when he is old enough that he may make the adjustment necessary to live with his deformity. The pre-school examination offers the physician an excellent opportunity to discuss the child's emotional as well as his phyiscal problems.

There are two age-periods in the development of the child where behavior problems are more prone to manifest themselves. The first, the negativistic age that begins at about eighteen months and lasts until five to seven years of age, is characterized by the child resenting discipline. "No", "I won't", "shut up" are all not uncommon re-

sponses to directives or disciplinary advice. The second begins at puberty and adolescence where the rapid physical and physiologic changes frequently encountered, produce many emotional stresses. The awakening of sexual impulses add to the emotional problems of this age. The adolescent is frequently a medically-rejected age. The youth of this period needs advice and medical counseling, but he especially needs a doctor who will listen to his problems with a patient ear. This is a time when abnormal behavior may present itself and the physician should be aware of conditions that produce this, as well as those that produce physical problems. The early recognition of emotional problems and pre-delinquent behavior patterns offers the best chance for a cure. We in pediatrics are concerned with the growth and development of the child—but there is little reason to develop healthy bodies with intelligent minds if they are to be used in an undesirable way.

References

1. Glueck, S., and Glueck, E. T.: Unraveling Juvenile Delinquency. New York: New York Commonwealth Fund, 1950.
2. McLendon, Preston A.: Juvenile delinquency; medical responsibility. Pediat. Clin. North America, 5:759-766 (Aug.) 1958.
3. Johnson, Adelaide M.: Causation of juvenile delinquency. Pediatrics, 17:934-946 (June) 1956.
4. Falstein, Eugene L.: The psychodynamics of male adolescent delinquency. Am. J. Orthopsychiat., 28: 613-626 (July) 1958.

Causes of Juvenile Delinquency

JOHN K. DONOHUE, M.A.
Saint Paul, Minnesota

JUDGE Leonard Keyes of the Saint Paul Municipal Court claims *a juvenile delinquent is a young person who needs society's help so desperately that he strikes out against society in an effort to attract its attention.* In any event, delinquency is frequently the result of a state of mind and may have as causation factors—poor heredity or physical environment. More often the cause is social. Real crime and delinquency is a deep-seated disease requiring as much skill in treatment and as long a convalescence as tuberculosis.

The attention of civic leaders, youth workers, and law enforcement authorities is focused upon the delinquent and his gang. Movies, television, and magazines paint the exploits of these boys in sordid and lurid detail. Voices rise in alarm demanding vigorous and often drastic measures to combat the phenomenon. There is a sense of unquiet lest we be confronted with a new problem—a frightening by-product of a war and an era of shaken values and scarred character. However, the sociologist and criminologist know that times change but people do not.

A recent *St. Paul Dispatch* asked this question: "Is juvenile delinquency a sickness or sport." The article goes on to say that primarily it is sport, adventure, and a way of life.

A large majority of delinquents, according to six experts in the field, are essentially normal youngsters. They are just running with the gang and doing what comes naturally. The study commissioned by the National Education Association disclosed that only 25 per cent of the nation's delinquents demonstrate any degree of emotional disturbance. According to these experts 85 per cent of all delinquents come from lower-class families. It is unlikely that their parents will belong to a service or fraternal organization; the boy may quit school as soon as legally possible; his male relatives will not wear neckties, and he has not learned to save. The authors of the National Education Association report included a pediatrician, a criminologist, a psychologist, a sociologist, and a cultural anthoropolgist. They found that, of the 85 per cent of delinquents from lower-class families, 70 per cent were normal boys with bad gang associates; that only 15 per cent were emotionally disturbed.

The experts headed by Dr. William C. Kvaraceus, educator, defined the middle-class youngsters as those whose parents belong to service and fraternal groups, whose male relatives wore suits and neckties, who had roots in the community and whose source of money was an allowance.

They find an increase of delinquency among these boys and said that although they only committed 15 per cent of the total delinquencies, that two-thirds of the group committing delinquencies from the middle class were emotionally disturbed.

Those who know the lower-class delinquent, know that it is a truism that his activities always occur as a product of group involvement. The structure and behavior of the gang have not changed. What has changed is the technical skill needed for use in meeting its challenge. Man is a product of the social milieu. Delinquents can become good citizens if they have good leaders, for as Joseph Joubert said, "Children have more need of models than of critics."

Doctor Kvaraceus goes on to say in his study that if the present trend continues, it is likely that perhaps one boy in five will show a delinquency record by the time he reaches draft age.

You, as medical men, know that character begins in the home. While the psychiatrists and probation officers may play important parts in society's attempt to readjust the delinquent, prevention of delinquency must be the product of the co-operation of home, school, church, and pediatricians like Dr. Harold Flanagan, whose paper is presented here. Children are not potted plants which can be moved around the house, they grow outdoors with all the risks of contamination from the weeds and other plants in the garden, subject to countless outside influences.

The social prediction table of Sheldon and Eleanor Glueck lists discipline of a child by his father, supervision by his mother, affection of father for the child, affection of mother for the child, and family cohesiveness as essentials in the prediction of delinquency. I quite agree with the Gluecks' and Doctor Flanagan as to the utility of such a table.

Our grandparents lived in a patriarchy with few outside influences. Men grew to manhood without ever traveling 15 miles from home, and they died in their grandfather's house. Today we are flat, historically. One family in five moves across the county line each year. The working wife is the pattern, and dad is not the head of the family. Most of the household tasks are now divided between husband and wife. Only childbearing and mending are exclusively the woman's task—even his trousers have been taken from dad.

To the Gluecks' factors quoted by Doctor Flanagan, I would add something from an older prediction table of theirs, "age at first misbehavior and length of time intervening between the onset of delinquency and adequate social study." We in the Juvenile Court think this factor is essential.

In any event, the sad fact about our great "Century of the Child" is that the number of these true delinquents is increasing rather than declining. Not because parents love their children less, but rather because the child is less secure in essential areas. He lacks a belief in history and the firm base of an Old Testament religion. An individual set of moral standards has been replaced by the demands of group conformity often at the expense of personal integrity. Today's child often needs an authoritarian father and more control. He should have independence but he must know that there are limits as to what he is permitted to do and that his parents will hold him to these limits.

In the light of the present-day developments, including an expansion of gang warfare in the bigger cities and teen-age hoodlum behavior here, with and without autos, there can be little doubt that an evaluation of modern standards for the upbringing of youth is both appropriate and necessary. I wonder if happiness should truly be the *alpha* and *omega* of life. When a large percentage of the nation's children become habitually addicted to patterns of behavior that are considered particularly anti-social and undesirable, when Juvenile Court delinquency in Saint Paul shows an increase of 20 per cent as opposed to a school population increase of 3 per cent annually, we must seek the primary cause. It is most likely to be found within those institutions which are dedicated to the mental, moral, and physical development of children. Modern parents and teachers have found it expedient to adopt a *laissez-faire* attitude toward the problem of parental guidance —and control of children—almost as though parents and mentors feared the child. *Even law enforcement may become so permissive that the law becomes a joke.* When I was a kid the cops on the beat knew me and kept me good with my parents' co-operation. New York's police were told to be "pals" and they are now reaping the whirlwind. When a small boy is caught stealing cookies and is given a spanking, a spanking administered against a background of love, affection,

and security, he has learned an important lesson. He has learned that punishment is certain, that it can hurt, and that it may deprive him of his parents' smile of approval. Obvious rules administered by a fair elder, with punishment imminent for the violator, give the child true security. Every child needs a pat on the back, often enough, hard enough, and low enough.

Children should live in a community which protects them against physical dangers and moral hazards, in a home where they are loved and matter very much to someone, a good safe place in a family circle. The child whose emotional needs are fulfilled and who knows that there are limits to what he is permitted to do will not become a serious delinquent or neurotic.

Emotional Aspects of Juvenile Delinquency

HYMAN S. LIPPMAN, M.D.
Saint Paul, Minnesota

From the Amherst H. Wilder Child Guidance Clinic,
Saint Paul, Minnesota.

TO continue Dr. Flanagan's interesting discussion of juvenile delinquency, I wish to share with you my concepts of juvenile delinquency derived from clinical experience with disturbed youngsters who were referred to our Clinic because of anti-social behavior. Since ours is a psychiatric clinic, these children were referred because of the impression they had left with the court, social agencies, schools, and parents, that there were serious emotional components in their delinquent behavior.

As one works with disturbed acting-out adolescents, it is difficult to escape the conclusion that they are struggling to find a way of life that will keep them in a state of psychic equilibrium. They must find a way to deal with their deep feelings of bitterness and hostility that result from evidences of having been rejected and unwanted. They have a need to get even for the many hurts they have suffered. This does not refer to all juvenile delinquents; it does to the majority who are emotionally conflicted and anti-social. As we look at their surface behavior we see cynicism, bitterness, and coldness. As we study them carefully we become aware that underneath these feelings are uncertainty and deep anxiety. These young people realize that their chosen way of living is a precarious one that may end in disaster.

Leaving discussion of delinquency for a moment, I should like to discuss the basic emotional needs of all children, since these needs have not been met in the delinquent child. Every child has a marked need for affection, and acceptance from two good parents who love him and need him. The early weeks and months of maternal care help to make the child feel that he is loved, by the "mothering" which provides for his physical, as well as emotional, needs. The close relationship between the mother and child is essential in helping him to distinguish between self and non-self, to understand and accept reality, and to learn to relate to others. These qualities which the child develops through identifying with his mother will be of inestimable value to him in all of his future dealings with other individuals. A child who has difficulty in relating to others lacks an important means of learning to know and enjoy others. His ability to accept others stems from the early warm relationship to his mother. He learns to trust others from this trusting relationship.

Another important basic need for every growing child is to be able to express aggression and hostility; to recognize and respond to those who attack him. Aggression will be needed by him as he competes with others in the games that

he plays with other children and in his learning and working. Understanding parents will not be threatened by his aggression which has been modified through their care. They help him to guide and control his aggression.

A child has a need also to express his sexual drives. These budding sexual drives will find their expression in temporary periods of genital handling, masturbation, in a marked curiosity about the sexual differences between boys and girls, and an interest in both sexes. It will be through these experiences and through his relationship to both parents that he will learn to differentiate between the sexes and determine the different roles assigned to both sexes. Wise parents have learned that it is important to discuss the birth process in a logical, straight-forward manner with the growing child, answering his questions honestly and avoiding misrepresentation.

The normal child is not born with social interests. During the first year of his life very little is asked of him and he is primarily on the receiving end of the line. His demands are great and they are acceded to. This is important in helping him to feel secure. Soon, however, changes have to be instituted and he must learn to accept frustration and denial if he is to become a social being. He must learn that certain kinds of behavior are unacceptable, that he must share with others, and that many pleasures have to be denied.

As time goes on, he begins to have feelings of remorse when he does something unacceptable to his parents, such as hurting a brother or sister, or taking something that he should not be taking. This feeling of remorse becomes greater during the second and third year of his life, and finally he begins to feel guilty and upset when he does something that displeases his parents. These are the early stages of the development of a conscience or a super-ego, which causes him to feel guilt whenever he carries out an act which is contrary to the wishes of his parents. When this has occurred, one refers to the child as having developed a capacity to control his behavior—he has been socialized. This process of socialization is a *must* for the healthy, normal child. The development of the super-ego which I have sketchily described, will serve as an important aid to his ego in dealing with unacceptable instinctual drives. During this process of socialization he has learned to accept reality and has given up acting on the so-called pleasure principle. He has reached the stage in which he is able to give up immediate pleasures for future rewards.

Another aspect of the emotional development of the healthy child, and which is one of his basic needs, is to work through both positive and negative relationships to both parents. This is referred to as the Oedipus complex and it is crucial for his future relationship to his own and opposite sex, that he be able to deal adequately with this conflict. Freud showed very early that the failure to resolve this Oedipus complex is the chief underlying factor responsible for psychoneurotic illness. The healthy resolution of the Oedipus conflict will help the growing child to emancipate himself and his parents and establish normal heterosexual interests away from his family. During this process he will repress his sexual attachment to his mother, will become strongly identified with his father, and learn to accept authority from other father figures that he will meet in life. You will note that I have emphasized the role of the mother in the early developmental period of the child's life. Intensive studies of the young child justify the importance placed on this particular relationship in the child's life. The role of the father, which is very important, does not manifest itself nearly so much in the early months of the child's existence, as it will later on. During the early months the father's emotional support of the mother and his love for his child are important in helping the mother to carry out her responsibilities of mothering.

The conditions under which most juvenile delinquents are brought up are in sharp contrast to what the normal healthy child meets. Basic emotional needs are denied him. The homes lack warmth, comfort and an atmosphere of security. More often than not, the homes are broken by desertion, divorce, imprisonment, or institutionalization. Delinquency in the parents, neglect and lack of interest in family life create a setting that encourages the children to spend as much time as they can away from home in unsupervised settings. Under such conditions of tension and strife there is little motivation for the children to develop social standards; nor is much energy devoted to work or study.

When, in addition, the parents are overly severe and cruel in their punishment, aggression in the youngsters is more likely to be hostile and vicious. There is little concern about the welfare and

suffering of others. The problems of such anti-social youngsters whose aggression has not been neutralized by affection, is a serious one. It is one of the major concerns of social agencies and sociological research.

Child psychiatry has been more concerned with juvenile delinquency based on emotional conflict. The term *acting-out behavior* refers to emotional conflict which is acted out against others as a defense against having to internalize the conflict. The mechanism that makes it possible to displace conflict in this way is not yet clearly understood.

The family of the neurotic delinquent generally is quite different from that just described. The family is more intact, and an attempt has been made to help the child develop social standards. The pathology is more likely to be in one or both parents who are neurotic, and have created neurotic tensions and conflict in the home. Adelaide Johnson, Stanislaus Szurek, Edward Litin, and others have shown in their studies that often such parents unwittingly encourage delinquency in their youngsters in order to meet their own unconscious unsatisfied emotional needs for outlets denied them. To determine whether this is the underlying pathology or whether the problem lies in other emotional conflicts in the child, it is important to carefully assess the total life situation of the emotionally-delinquent child in order to locate conflict situations. Child guidance clinic staffs include social case workers, clinical psychologists, social group workers, and psychiatrists—in order to study every important aspect of the child's life. This includes the family, the school, and the community.

The most seriously disturbed youngsters—those whose conflicts are deep and fixed—do not respond well to psychotherapy. They require more intensive in-patient care over long periods in a setting where a variety of approaches in therapy can be utilized. Psychiatry of the future will have to devote much more time to research with these youngsters who are so very resistant to therapy. We know too little about them at present, and it is imperative that we know more. It is from this group that the serious sexual offenders and youngsters capable of the most wanton, cruel, and destructive behavior, come. This group also includes psychotic youngsters whose illness often begins with violent acting-out behavior.

In the process of describing conflicted acting-out youngsters, I should not overlook non-delinquent pre-adolescents and adolescents who are in emotional conflict. This is a problem of maturation in which the ego and super-ego attempt to deal with the sudden increased sexual demands during puberty. All the defenses which the ego has built up during the quiescent years from five to eleven years come into play, and often the picture is one of great turmoil. Anna Freud made an intensive study of prepubertal boys and has described the tension, panic, and psychotic-like behavior that may take place at this time. The period is a temporary one and lessens when the drives are satisfactorily mastered. During this period there may be an increase of aggression, destruction, cruelty, and acting-out behavior. If this is exaggerated and persists, psychiatric study and treatment is indicated. In most cases it does not persist.

As in other aspects of medicine, the treatment of juvenile delinquency starts with diagnosis to differentiate the environmental social factors from the personal intrapsychic ones. Most social agencies engaged in family and children's services are able to make this differentiation. When there is question about diagnosis, psychiatric services are requested. Many of you may be unaware of the strides social workers have made in the understanding of the dynamics of emotional conflict during the past twenty-five years.

Since the core of the problems of juvenile delinquency lies in the home, all services that help to strengthen the home help to lessen the development of delinquency. Every effort must be made to provide each child the affection and security he needs. Homes that are disorganized by delinquency, serious neglect, immaturity, and mental illness, are sore spots in the community and require special care. Saint Paul has done excellent research with a large group of such families during the past few years, with funds contributed by the Hill Family Foundation. The project is called the Family Centered Project, and is widely known throughout the country. This study has demonstrated that the disorganized families, after initial resistance, gladly accept the services of well-trained case workers. The number of such families that one worker can reach is small as compared to case loads in the average public welfare agency; twenty is the largest number that can be adequately serviced. I recommend that you read the reports of this Project which, among other accomplishments, has helped materially to

reduce juvenile delinquency in these families. In view of the dangers involved if a child cannot be provided his basic emotional needs, whenever case work establishes the fact that parents are inadequate to raise a child and cannot respond to casework treatment, the child must be removed from his home and placed in a suitable foster home.

Most agencies working with juvenile delinquents and their families need more staff to even approximate adequate services. It is ridiculous to ask a well-trained probation officer to deal with seventy-five to 100 juveniles who have started in careers of crime. There is no opportunity to even know the members of the families of these youngsters and their problems, let alone know the emotional needs and conflicts of the youngsters themselves. The same applies to all social agencies who work with families needing intensive help.

Institutions for delinquents need large numbers of trained social workers in addition to psychologic and psychiatric services. Nothing can take the place of a warm daily personal contact with these institutionalized youngsters, many of whom are reaching out for help. Youngsters who have always been deprived of affection would have a reasonable chance to find themselves by identifying with an adult who shows a genuine interest in them and maintains this interest—a new experience for most of them. If this interest could continue after leaving the institution, the gains could be even greater.

I feel quite confident that if society were really interested in doing something about the delinquency problem, significant gains in prevention and treatment could be made by putting into effect all the knowledge gained by sociologic research, social work and psychiatric clinical studies. Unfortunately, society is either not well enough informed about this knowledge, or for reasons that are not clear, does not insist that required action be taken.

In the meantime, psychiatry will continue to seek for more effective methods for dealing with the serious emotional intrapsychic factors that produce and maintain anti-social behavior. It is good that the general medical profession is concerning itself with this problem as manifested by this panel discussion.

Juvenile Delinquency and the Clergyman

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IT IS NOT the purpose of this discussion to define juvenile delinquency, so we shall just accept as subject matter those who are spoken of generally as juvenile delinquents. Although the clergyman is not always the best person to turn to in the counseling of problem children, he nevertheles is a natural resource person for many people because of his spiritual relationship to his parishioners. We may say that he is "not always the right person" because many clergymen have not received the specialized training for guidance in youth problems which have a clinical cause and effect basis. Moreover, many clergymen, in the pursuit of holiness for themselves, which people have a right to expect in their pastors, cannot easily conceive the complex causes of behavior which seem merely irreligious. I would say at the outset that this is not necessarily a defect in a clergyman because it is a perfectly respectable expectation that ministers, rabbis, and priests be concerned with sanctity and spiritual progress first and that which impedes it second.

Therefore, it is a wise pastor who recognizes his own limitations in the spiritual guidance of difficult persons of all ages. He would then, it is to be expected, make the proper referrals to those experts whose work it is to deal directly with those who deviate in what we may call a clinical manner. I say "clinical manner" to show a difference between behavior which may deviate in an understandable manner. The second kind of deviation can be handled easily by all who are interested in their fellow men, and clergymen, of course, are specially suited to this kind of guidance.

Experience in spiritual guidance should teach the difference between these two kinds of deviations. For example, if I were to be called upon to help in the counseling of a lad designated correctly or wrongly as a juvenile delinquent, I would be specially careful to make a judgment that I was either competent or incompetent to handle the case. If I should judge at once that I have a clinical case on my hands, or indeed after several interviews, I would immediately search for a resource person or institution that could cope with the problem as soon as possible. I would be aware that if I were incompetent and did not make a proper referral I may either delay effective counseling or further complicate the problem by oversimplifying it.

This is not to say that a clergyman should be reluctant to give guidance to delinquents or that he should be always fearful that by counseling he is encroaching on another field. Actually there are many cases which involve simple problems which arise out of normal causality that a clergyman is far more competent to handle than a clinician. The science of clinical counseling is a very young one indeed and is still struggling for formation. The structure of the science is far from a static one. Although great progress has been made, there are still lacunae which spell caution. It is entirely possible that a particular problem lad may not be so much a problem as would appear. If he were subjected to some clinical processes without necessity, it could well precipitate him into a difficulty that would permanize what otherwise might have been a transitory ailment.

It would seem that teamwork by clergymen and the various kinds of clinician would be the ideal set-up in handling juvenile problems. We are well aware that the psychological sciences are fearful of the bungling of clergymen, but there exists along with this fear the anxiety of clergymen that psychological scientists will rob people of the spiritual formation and motivation that have sustained men for many centuries. This seeming conflict is an unfortunate one because a humble counselor, whether he be a clergyman or a psychiatrist, will readily understand the role of his counterpart and will not hesitate to make wise referrals when this is indicated.

Often the seeming conflict we have described grows from an ignorance of the purposes and techniques which are set forth. The conflict is furthered by the complications of language. If, however, one is concerned enough about this conflict to resolve it, one will readily see that the frames of reference, or language, can be misleading, for the fundamental ideas expressed in the different forms of language are close to identical. Those afraid of Freudian language, for example, will insist that this excludes the conscience. Yet, the superego of Freud is easily conscience to the clergyman. Free will is easily ambivalence.

From what I have said, I would like to prove that there is no conflict among humble scholars who presume to help in the spiritual life of others. Whether the motivation be religious or clinical the aim is, or should be, high moral character and spiritual comfort. Lest this be misunderstood as too broad a point of view for a clergyman, may I say that the final concern of a dedicated minister, rabbi, or priest is the supernatural disposition of the soul. The common interest of religion *and* science is to establish a natural hygiene of the soul. We are very happy to hear in this discussion the profound observations of Dr. Lippman who has dedicated himself in such a renowned and successful way to the care of youth behavior. We are likewise grateful to learn from the long experience of Mr. Donohue what the problems are from a social worker's point of view in observing a young person in relation to his family and community.

I think all of us feel a great security in the guidance of a psychiatrist because of our assurance that the physical well being of the child is known and evaluated since so often the roots of disturbance are physical. The psychologists often can contribute a deep insight from their knowledge of the behavior patterns established by research. The psychiatric social worker, a newcomer to the

team, can often be the most important factor in child guidance because he has the opportunity to observe the surroundings of the subject, the smallest element of which may be the cause of the disturbance. The clergyman very often is the shortest way to a problem because his rapport with the subject has often been long established, and the subject finds it easy and comfortable to relate to him. All these principals together make up the ideal team to work in counseling and guidance.

In trying to understand the young person who is disturbed, or who has fallen into trouble, it is necessary to isolate the individual theoretically from his environment. That we might better understand his identity *per se* is important, also that we try to conclude what is the subject's evaluation of himself. Then we proceed to see what is essentially and what is accidentally identified with him and his experience. This opens the whole vista of environment. The force of heredity, though greatly exaggerated, ought to be judged. At least it is of some good to know the physical and psychological antecedence of a subject. The known and unknown influence of parents must be studied thoroughly. Theories of pattern relationship ought to be explored. Socialization of the subject with all his necessary and chosen acquaintances ought earnestly to be examined. This, of course, is especially important because socialization is not only an important factor in the maturation of children, but often can be reworked for the solution of children's problems.

I would think that this recipe for the examining of all children, as well as only those with problems, would be the common methodology of all counselors. Each kind of respectable counselor can contribute in this common technique.

I think it can be said that light or surface neuroses can be handled effectively by properly qualified clergymen. My caution to any clergyman would be to seek help or make referrals if there is evidence of deeper neurosis, and certainly any kind of psychosis.

Whether we are talking professionally or non-professionally about juvenile delinquency, we must certainly not press the panic button. If we have a special problem in juvenile delinquency today it calls for clear unprejudiced thought and action. Let us not look for too much from legislation. Legislation limits only outward visible activity. The solution is to inform and keep informing as many people as possible that behavior is in individuals. Establishing a climate in the home or in the city for good sound behavior is important. This is not done by legislation. This is done by personal appeal to those who understand the ravages of unordered environment. Despair should find no place in the attempts to do this because actually in spite of all that is being released by our news agencies, there is reason to think that there is a growing improvement, at least in some quarters. When a problem arises in a well ordered environment, it is easily discernible and, like cancer, can often be cured or cared for if caught early enough. Problems which emerge from a chaotic environment should be coped with when and if possible. Our hope is that we shall gradually be able to intrude on the chaos and all of us together make a progress of which we can be proud.

I realize that I am talking to a group of medics, and I should like to say to you that the clergymen in your community must be reckoned with. Personally, of course, you are free to associate with them or not, but officially by your professions, you are thrown in with them. Your patients are their flocks. Many of the clergy are eminently attractive because of their holiness, education, winsome ways, community interests, or what not. Others will be difficult to understand, not specially friendly to you or your practice, or seemingly inimical to scientific progress. You cannot write them off. And how often you may have to turn to them for their help in dealing with your patients! The clergy needs enlightenment, but so do physicians.

Generally, I think you will find that the clergy is flattered by any friendly word or act you extend to them. They will be happy to respond in kind. It gets down to this. You need them and they need you. We have much to learn from one another.

May I add that as often as the clergy need physicians the physician may stand in need of the ministrations of his minister, rabbi or priest. The sooner the old conflict of science versus religion is buried the better off all of us will be.

Juvenile delinquency (to get back to that) is a medical problem, a social problem, and a religious problem.

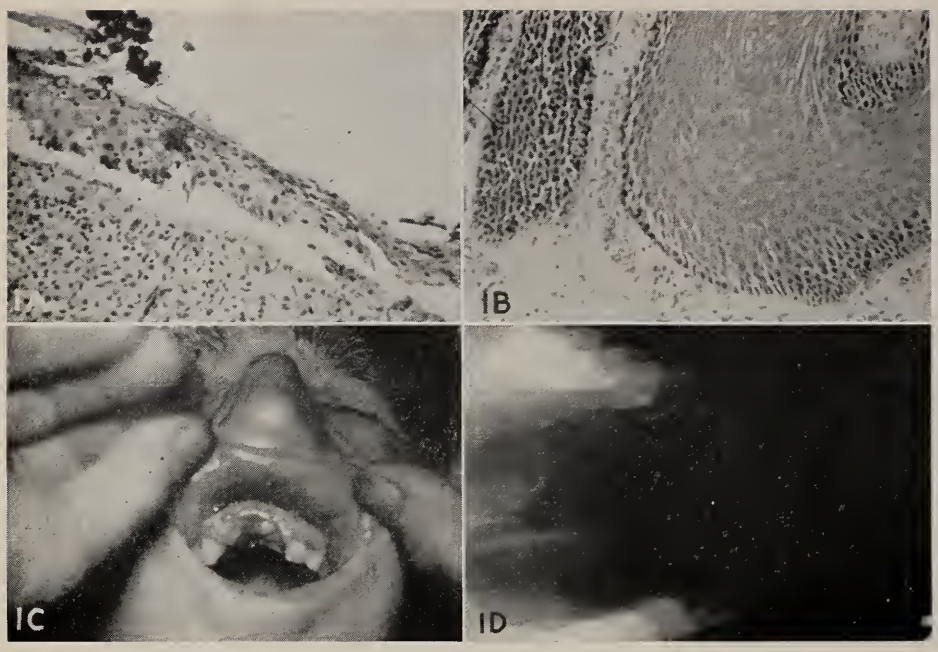


Fig. 1. (A). Early squamous cell cancer of the intradental buccal area showing bowenoid changes with nuclei of varying sizes and shapes. (B). Verrucous carcinoma showing marked activity in the basal cell areas with hyperchromatic nuclei and deep projection of acanthotic epithelium into the underlying connective tissue. (C). A large squamous cell (P_2N_0) on the upper anterior gingiva. Patient had upper teeth removed before the course of radiation. (D). Radiograph of the same case showing destructive process involving the hard palate. Patient has a one-year cure of the lesion with combined x-ray and external radium application.

Carcinoma of the Oral Cavity

Part I

● *Conclusions after the care of 783 patients*

THE TREATMENT of cancer of the oral cavity is a complex problem: It is viewed by some as a hopeless task and not one to increase one's popularity or reputation. Yet for the past forty years our group has felt that we must take the difficult treatment problems in cancer therapy, as well as the much easier and more rewarding assignment of curing basal cell and squamous cell cancers of the skin. We have inherited from our predecessors adequate facilities, experience derived from early experimental treatment with various methods and a reputation in the community which we must uphold.[1] We have answered the challenge and, although discouraging at times, it has produced gratifying results.

A. J. Gardham's[2] classification of neoplasms in the buccal cavity has been a guidepost, especially to those who approach this problem from a radiation viewpoint. He divides these lesions into:

Group I. Neoplasms which are:

1. Accessible.

2. Do not show signs of high malignancy in regard to spread, metastasis and reaction to treatment.

3. Do not show signs of high malignancy in their microscopic picture (Grade I). This includes most cancers of the lip, most cancers in the inner

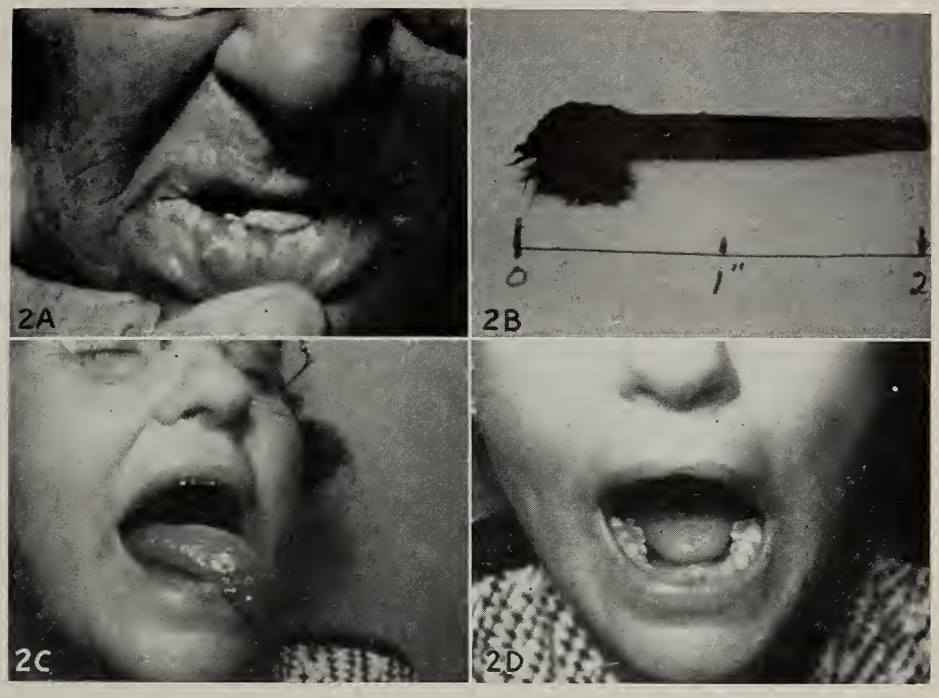


Fig. 2 (A). Verrucous carcinoma arising in various areas on the inner surface of the lower lip and each intradental line in old leukokeratosis resulting from years of dipping snuff. (B). A brush used to dip snuff made from the root of a redbud tree (length 2 inches). (C). Squamous cell carcinoma arising in leukokeratosis at the edge of the tongue in a patient with a narrow space between the lower bicuspid and molar areas. (D). Lower inverted teeth producing a sharp, razor-like edge. The patient was first treated with radiation, but teeth were not removed. The lesion immediately recurred. Before further treatment was successful, the irritating bicuspids were removed.

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cheeks, and some cancers situated on the anterior two-thirds of the tongue.

Group II.—Neoplasms which are inaccessible but still do not show signs of high malignancy. This would include cancer of the floor of the mouth, epiglottis and pharyngeal areas. If they do not involve the bone they may be cured by radiation.

Group III.—Neoplasms of high malignancy.

1. Microscopically Grade III and Grade IV cancer of the lower jaw, submucous infiltrating lesions of the nasopharynx, posterior one-third of the tongue, and the lesions of the upper jaw.

2. Five-year survival in this group is negligible with either radiation or surgery.

3. Striking long-term survival has been produced by palliative radiation therapy with radium and filtered x-rays, plus the co-operation of a conservative cancer surgeon who appreciates the use of the two aforementioned modalities. He waits until the radiation effects have produced all of their results, then decides what procedure to follow.

Group I is the field in which we have been interested; the cure rates have been surprisingly high, expense to the patient is low, and the minimal loss of tissue remarkable. All of our cases have been seen in private practice; therefore, the

cases are seen early, the lesions are smaller than those observed in a group of charity patients, and the prognosis is much better for cure. Decisions as to treatment are made from a radiological viewpoint. If surgery is deemed advisable later on, a surgeon is called in consultation to see the case before it is treated with radiation. His advice many times is accepted by us, although many times not by the patient.

Pathology

The pathological changes for the most part in our buccal malignancies are compatible with squamous cell carcinoma Grade I. The changes are minimal according to criteria for skin cancer, and the general pathologist may make a diagnosis of leukoplakia or leukokeratosis even though clinically there is induration, a rounded border (at times ulceration), and is clinically diagnostic of cancer. We must then understand the normal pathology of the mucous membranes.[3] There is no normal keratin produced in the mouth except in the epithelium of the gingival borders. When we see hyperkeratosis with parakeratosis, it indicates an early malignant change and this means much more than when seen in precanceroses of the skin where production of keratin is normal.

Montgomery[4] states that when cancer supervenes in leukokeratosis, it is not manifest by cords and strands breaking through to the underlying corium but is often seen intra-epithelially, "cancer *in situ*," with features of Bowen's disease, variability in size and shape of the epithelial cells, and large, giant type, nuclear arrangement (Fig. 1-A) with heavy chromatin content, but usually showing epithelial bridges. Cipollaro and Foster[5] have also stressed these "bowenoid" changes in the mucosa.

A second group of oral squamous cell type cancer (intra-epithelial) is one in which the pathological changes are rarely recognized as a malignancy. This group is described by Ackerman[6] and others as Verrucous Carcinoma. It comprises a high percentage of the mouth cancers we are called upon to treat. The lesions occur predominantly in aged men or women, most commonly on previous leukoplakia of the buccal mucosa and lower gingiva. Use of tobacco for years is significant etiologically. Slow-growing, verrucous in character and often extensive, this neoplasm tends to involve local structures (mandible and soft tissues). Distant metastasis seldom occurs and local lymph node metastases are rare. Microscopically, they show a well-differentiated epithelium with an intact basement membrane; the basal and Malpighian cells of the epithelium usually show a tendency to hyperactivity (Fig. 1-B), loss of polarity and increased chromatin content. Small biopsies are always reported benign and only by studying a tumor removed in toto is the true invasive malignant nature of these benign-appearing growths shown; however, in total surgical removal the danger of recurrence is probable.

Ackerman reported that there are local recurrences in inadequately treated patients in a high percentage of cases: Out of fourteen patients he treated with roentgen rays alone, eight suffered recurrences (57 per cent). He therefore advises surgery for all but the very small lesions, but his surgically treated patients also suffered recurrences. Therefore, it behooves the physician treating cancer of the mouth to stand on his own clinical diagnosis of carcinoma. He must make his decision of radiation treatment to a cancer on past history, that is, the use of tobacco, rubbing dentures, carious, sharp teeth, the progress of the lesion and the clinical appearance.

The therapist must study his own microscopic slides and be aware that any changes in the keratotic layers, namely, parakeratosis, activity in the basal cell layer, any "bowenoid" changes in the epithelium, must be taken as a carcinoma and treated as such. Early adequate treatment of all borderline lesions is recommended in the face of benign reports from the pathologist rather than procrastination in awaiting a biopsy report that would be called by many the only basis for therapy of a cancer. The x-ray therapist's responsibility is to his patient, and if bad results are encountered by waiting, the therapist must bear the blame, not the pathologist.

The importance of a positive biopsy report on a medico-legal basis has been overstressed. The jury is not interested in medical arguments of borderline lesions, but is instructed as to the integrity of the physician and his reputation for treating cancer over the years. A pathologist who recognizes these pitfalls, that is, difficulty in diagnosis in the mouth, is a great asset to the therapeutist in this situation.

Out of fifty-four cases studied in the 1949 to 1954 series, twenty-three biopsies were recorded. Many of the thirty-one cases without biopsies included very aged people who refused any operation involving an incision. Several had religious scruples against any surgery, but radiation was "God's mysterious light" and was permissible.

Then a certain percentage were in areas on which it was deemed dangerous to disturb the tumor bed; that is, transitional Grade III or Grade IV, rapidly growing squamous cell cancers in the posterior tongue area, tonsillar pillars, floor of the mouth, and gingival lesions of the lower jaw. In these cases the fear of metastasis from biopsy is still considered to be of importance. Of the twenty-four biopsied cases, the records show:

TABLE I. LOCATION OF ORAL CANCER STUDIED IN THREE GROUPS (1944-1949, 1949-1954, AND 1954-1959)

Period in Years	Buccal			Tongue			Floor of Mouth	Palatine	
	Ant	Mid	Post	Ant	Mid	Post		Ant	Post
1944-1949	18	37	14	2	2		11		
1949-1954	2	8	3	9	3	4	5	2	5
1954-1959	8	23	10	12	6	3	10	2	2
				Entire Tongue 1					

Period in Years	Inside Lower Lip	Gingival		Cancer of Lip	Total Cases of Mouth Only	Total of Mouth and Lip Combined
		Upper	Lower			
1944-1949				183	84	267
1949-1954	3	1	8	174	54	228
1954-1959		2	2	197	91	288

Squamous cell cencer, Grade I	8
Squamous cell cancer, Grade II	6
Squamous cell cancer, Grade III-IV	5
Verrucous carcinoma	4
Glandular adrenocarcinoma	1

Etiology of Oral Cancer

There are definite borderline lesions in the mouth which may be classified as so-called precanceroses, but one must always veer toward the malignant side in all oral lesions. In listing precanceroses in the mouth, nearly all malignancies arise from leukoplakia,[3] then to thickening and leukokeratosis, and finally cancer; consequently we can say that the main precancerous lesion in the mouth is leukoplakia. Large, verrucous lesions are nearly always cancer, but small, punctate verrucae may occur in the hard palate area and about the floor of the mouth. These are usually soft and sessile and clinically a differentiation can be made.[7] I have seen very few malignancies in the mouth arising from so-called small verrucae.

In July 1953 at the International Congress of Radiology in Copenhagen,[8] the committee on Stage Grouping in Cancer and Presentation of the Results of Treatment of Cancer adopted certain alphabetical and numerical figures to simplify the presentation of cancer cases of the breast, larynx, and cervix uteri. The following classification is a composite of those suggested by the International Committee on Presentation of Results of Treatment of Cancer International Congress of Radiology in 1953 and was used in the presentation of results in oral cancer at the American Radium Society in 1959 by MacComb and Fletcher.[9] It will be used in this paper also to simplify presentation of our results. For squamous cell carcinoma occurring in the mouth first the size of the lesion is described by the letter and number:

P_1—3 cm. or less in size.
P_2—3 to 5 cm. in size.
P_3—Above 5 cm. in size.
P_4—Massive extension.

The lack of any palpable lymph nodes or their appearance is tabulated by:

N_0—No palpable nodes.
N_1—One single node small to moderate size, less than 2 cm., situated unilaterally.
N_2—Large, unilateral, movable node above 2 cm. in size, or multiple unilateral nodes.
N_3—Bilateral nodes, or fixed unilateral nodes more than 2 cm. in size.
N_4—Distant metastasis.

Location of Oral Cancers

The location of oral cancer has been found to be in the greater percentage of cases on (1) the sides of the buccal cavity, (2) along the interdental line, and (3) the tip and sides of the tongue.

The buccal surface was divided into anterior, middle and posterior. From 1944 to 1959, a total of twenty-eight cases was located on the anterior buccal surfaces, sixty-eight cases on the middle, and twenty-seven on the posterior surface.

For the same period, the tongue was the loca-

tion for a total of twenty-three cancers on the anterior portion, with eleven on the middle third, and a low percentage on the posterior third of only seven.

The palatine area was divided into the anterior or hard palate region on which only four cancers were recorded; on the posterior or soft palate area, seven cases; inside the lower lip three cancers were seen.

On the gingival area the cancers were divided between those on the upper and lower gingiva (Fig. 1-C and D); three patients were seen with cancers on the upper gingiva, and ten patients were seen on the lower. In the gingival area the cancer sometimes is cured by radiation alone. The vast majority of these malignancies is Grade I squamous cell carcinoma; however, some of the lesions are of the penetrating, burrowing, verrucous type cancers which clear with radiation, then recur and finally involve the underlying bone. However, in several instances on the lower gingiva, they have been cured following recurrence from irradiation by surgical removal of over one-third of the mandible.

Cancer of the lip was seen the most frequently with excellent results from radiation; 318 patients[10] were studied in detail; actual cancer deaths recorded were only twenty-two, with a determinate cure rate of 93 per cent, but an actual five-year cure rate of only 70.5 per cent. Many older patients were lost from other diseases before the five-year period was up, while numerous others moved out of the state and contact with them was lost; however, through the years 1944 to 1959, we feel that our determinate cure rate in cancer of the lip was in the 98 per cent bracket.

When a metastasis was evident in our lip cancer patients, a yearly total of sixty cases, they always reported to us immediately. We have seen only one or two patients per year in the past fifteen years who have had metastasis following therapy with a combination of x-rays and interstitial radium needles locally, plus prophylactic x-rays to the gland-bearing areas. In this period (1944 to 1959) we have treated a total of 554 lip cancers, a total of 229 oral cancers, and a combined total of lip and mouth cancers of 783.

A study (Table II) was made of eighty-four cases of oral cancer treated with radium, both with external radium applications and interstitial radium needles, and x-rays from the years 1944 to 1949. At that time there was a great variation in the treatment of each case by various members of our group; some were treated with electrosurgery followed by filtered x-rays; some by radium applications. Another group was treated with interstitial needles without combination with x-rays, and it was impossible to work up any data on therapy and results. However, in this group it was interesting that forty-nine cases had no signs of metastasis on first examination clinically (N_0), with no lymph nodes palpable in either submaxillary region. Thirty-five of the cases had a suspicious node or nodes in the lymph drainage areas in the submaxillary and submental regions. Many of these suspicious nodes completely disappeared after irradiation; others remained for the duration of the patient's lifetime (after several courses of roentgen therapy to the involved node) without any regrowth, but there was still an indurated area that could be palpated. Others, where surgical excision was refused, have completely disappeared with several subsequent x-ray series windowed closely to the node. Several were treated with 6000 r from interstitial radium implants and were cured.

In the second series studied (1949 to 1954) only nineteen cases (Table II) of the fifty-four total cases showed a palpable suspicious node or nodes; possible metastasis (N_1 to N_3). Of this group (Table IV), eight later died with cancer metastasis; of the other six who died of oral cancer, the metastatic nodes appeared from three months to seven years after the original examination.

Causes of Oral Cancer

1. *The Use of Tobacco.*—The etiologic factors in oral cancer (1944 to 1954) are tabulated in Table II; a total of seventy-four patients gave a history of using tobacco. Pipe smoking (twenty-six cases) seemed to produce the highest number of malignancies. It is felt that heat from pipe smoking is the causative factor in cancer of the mouth. The area usually is localized to the point where the pipe is held; therefore, the lesions are as a rule in the interdental line in the buccal areas and over the gingiva or on each side of the tongue and the floor of the mouth.

In cigarette smokers, a total of eighteen cases, the malignancies usually arose in each buccal commissure or posteriorly on the tongue, or the posterior tonsillar-buccal area. In all of these cases in which smoking seems to be a factor the patients are asked to discontinue this habit; however, this was a difficult task and some never accomplished it.

The sixteen snuff dippers were all women from seventy to eighty years of age (Fig. 2-A). This is probably the most difficult habit of all to break; many patients would rather dip snuff than eat.

There was a malocclusion or a narrowing of the horizontal plane of the floor of the mouth in five cases of cancer of the tongue. The lower molars and bicuspids angled inward on each side, thereby

TABLE II. ETIOLOGIC FACTORS ENCOUNTERED IN CANCER OF MOUTH

Period In Years	Male	Female	Size of Primary Cancer in cms.				Palpable Nodes When First Examined				Tobacco Users				
			1½	2	3	5	N_0	N_1	N_2	N_3	Snuff	Pipe	Cig.	Cigar	Tobacco Chewers
1944-1949	58	26		P_1		P_2	49	35	—	—	7	15	10	5	2
1949-1954	34	20	12	18	12	2	35	19	—	—	9	11	8	2	5

Period in Years	Rubbing Plates	Malocclusion	Rough Sharp Teeth	Plus Dental Caries	Chronic Histo-plasmosis	Galvinism	Alcoholism	Serology ††††	Under Arsenical Therapy	Serology Neg.
1944-1949	14	5	13	14		2				
1949-1954	13		7	7	1	3	1	4	2	6

Therefore, a great factor of avitaminosis both of B Complex and C in these cases was present. It is felt that in all of these older people, if the cancers are cured, they should receive multiple vitamins orally with mineral contents in proper proportions. At the same time they should receive ten to fifteen units of crude liver extract once or twice weekly parenterally.

Snuff is composed of the residues of the leaves, and stems of tobacco plants, and seems to contain more irritating substances than plain leaf tobacco; thus, it may be more irritating than plain tobacco from the leaves. (Figure 2-B) shows the redbud root, two inches long, which makes an excellent applicator. It is moistened and this is then dipped into the snuff box and placed in the oral cavity with the stick end of the root protruding from the mouth. The older this applicator becomes in use the better it is thought to be. Cigar smokers and tobacco chewers make up the small proportion of tobacco users—seven patients each.

2. *Rubbing Dentures, Malocclusion and Sharp Teeth.*—The rubbing of artificial dentures, the presence of sharp, ragged teeth and malocclusion of the teeth were thought to be the causative factors in fifty-nine cases of oral cancer; twenty cases showed sharp, carious teeth in close proximity to the area of the cancer growth. Many of the articles on radiation treatment of cancer of the mouth suggest extraction of carious teeth preceding radiation therapy. Obviously sharp, ragged teeth causing direct trauma should be eliminated; rounding off the sharp points is preferred to extractions.

causing a saw-like action on the tongue as it goes in and out of the mouth (Fig. 2 C and D). It is felt that the teeth causing this trauma to the tongue must be removed, and, if there is a malignancy present, they should be left out permanently. No partial dentures are advised.

3. *Carious Teeth.*—Carious teeth were the positive etiologic factor in twenty-two patients of oral cancer (Table II). In our experience, however, when a patient comes to us for treatment of cancer of the mouth, we feel that damage from old, carious teeth in most instances has already been done; that a certain immunity to the variable micro-organisms, that is, bacteria, actinomycosis, spirochetal and leptothrix organisms, is present and that extensive extractions may be extremely dangerous unless there are very few teeth and they can be removed easily. Therefore, 95 per cent of the time in our practice the teeth are left intact before radiation therapy is instituted, but local measures are taken to clean up the mouth such as washing of the teeth twice daily with tooth paste. We have seen only a few cases of osteomyelitis or radionecrosis of the mandible following radiation. If the teeth need to be removed later, a period of three or four years is allowed to elapse following radiation before extraction. It has been our observation with those who have artificial dentures that, after the malignancy in the oral cavity has been cured, the danger from rubbing plates causing a recurrence of the cancer is probable; consequently, the patient is not allowed to wear the artificial dentures again excepting for short intervals as in the case of a special public appearance.

4. *Galvanism.*—The effect of electric galvanic currents between dissimilar metals in the mouth was a definite factor in the cause of leukoplakia, leukokeratosis and cancer in the mouth in five patients (Table II). Figure 3-A shows a squamous cell carcinoma arising immediately adjacent to the gold fillings. There were many amalgam fillings in this patient's mouth which showed from 20 to 30 microamperes of current running towards this gold filling immediately adjacent to the squamous cell tongue cancer. Lain, [11-15] emphasizes the importance of this factor in oral leukoplakia and cancer. It is felt that when the amalgam fillings are being disintegrated by the galvanic current from dissimilar metals that the tin and nickel of the amalgams become ionized. These ionized metals pass into the saliva and become deposited in the tissues of the gums or tongue, causing (1) a metal irritation, (2) leukoplakia, and (3) eventually cancer.

Burkett[6] describes a case in an electrician who developed a leukoplakia on the tongue which was thought to be due to testing the electrical potential of batteries (galvanic current) by applying his tongue to two wires connected to the positive and negative poles of the battery.

Several other minor etiologic factors in the production of oral cancer must be considered. It is the opinion of MacComb and Fletcher[9] and others that the chronic use of alcohol is an important cause of mouth cancer, although it is rarely recorded in our two series. It is a question which has not been asked frequently enough in our cases and it is, I believe, a much more common occurrence in these cases than was previously suspected. Leukoplakia of the tongue with subsequent cancer has been stressed, occurring especially in syphilitics; however, only four cases in the later series were encountered in which the Wassermann reaction was positive. Two of the cases were undergoing arsenical forms of therapy when they reported with cancer of the tongue. In one case (Fig. 3-B), the lesion was treated with arsenicals for nine months as a gumma before cancer was finally suspected. One of our cancer deaths recorded was this patient. In our experience, the simultaneous diseases of syphilis and cancer have always given a poor prognosis.

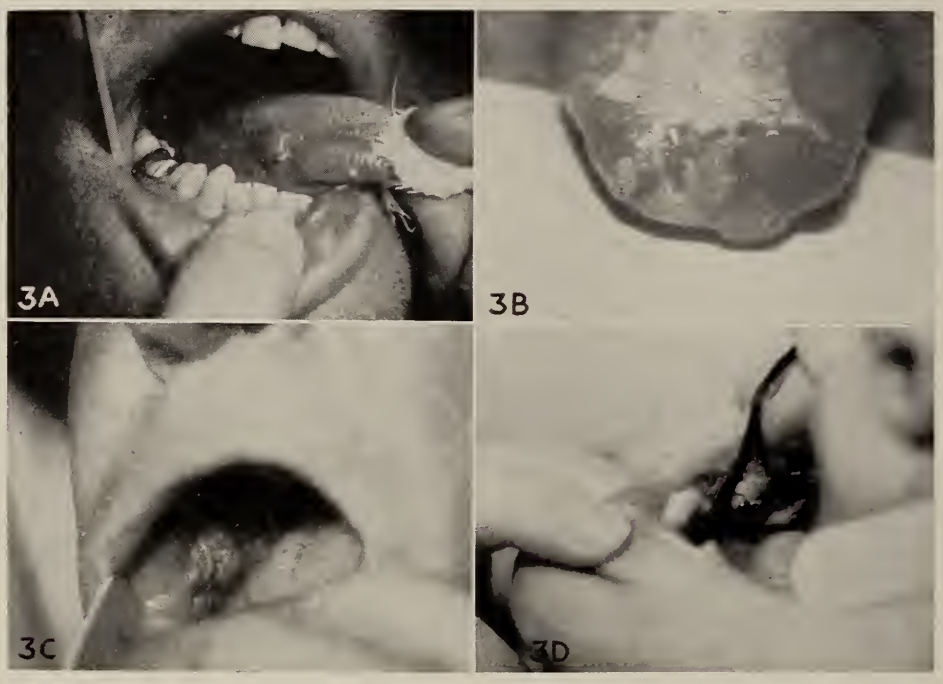


Fig. 3. (A). Squamous cell carcinoma arising at the side of the tongue in direct contact with a gold crown. A high galvanic current of 30 to 40 microamperes was registered between this gold crown and surrounding amalgam fillings in other teeth. (B). Case 54, the first of three squamous cell carcinomas, 1.5 cm. in size, P_1N_0, on the tip of the tongue as recorded in Table IV. Leukokeratosis covers almost the entire surface of the tongue. Patient had been under treatment for syphilis for several years. (C). Squamous cell carcinoma arising on the inner buccal surface in a pipe smoker. (D). The same lesion with insertion of interstitial radium element needles.

(To be concluded in the March issue)

Nutritional Requirements of the Neonate

TABLE I. UNDESIRABLE TRENDS IN INFANT FEEDING

Failure to dilute and/or add CHO
Formulas of excessive caloric potency
High protein
High carbohydrate
Unreasonably early introduction of solid foods
Unreasonable promotion of products of unproven worth
Appetite—growth stimulators

● *Breast feeding is the ideal regimen for a neonate. Failing that, the simplest artificial feeding regimen employing humanized cow's milk should be employed. Ordinarily, only Vitamins C and D are essential supplements. The importance of essential fatty acids is becoming increasingly appreciated.*

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Northwestern Pediatric Society Lecture, presented before the Minnesota State Medical Association, Duluth, Minnesota, May 27, 1959.

THE FACT THAT a portion of this program can be devoted to a discussion of the nutritional requirements of the first four weeks of life signalizes the sensational progress which has been made in the field of infant feeding. Only a few decades ago, the complexities and hazards involved in the use of artificially prepared milk mixtures constituted the most compelling indication for the establishment of breast feeding. Practitioners of that time were engrossed in the intricacies of juggling the various constituents of a formula and supervising its concoction. The whole procedure represented, in a sense, both a mathematical science and a fine art.

Over the years, as a result of prodigious studies in research and processing technology, the artificial feeding of infants has become a safe, simple and eminently successful procedure which is quite standardized. Indeed, it has proved so successful that question of the desirability and advantages of breast-feeding appears to have been generally relegated to the realm of philosophic, ethical or psychologic considerations, in spite of certain definite pragmatic superiorities. Actually, from a nutritional point of view, little can be said to justify claims of superiority of breast milk over cow's milk, although, as will be pointed out, greater vigilance is required in the use of the latter, particularly during the first few weeks of life.

Some measure of the refinements of processing techniques made possible by standardization of feeding can be obtained from the following figures which indicate the availability (and competitive market) of proprietary products in 1952:[1]

500 (approximately) different brands of evaporated milk
24 different companies manufacturing 58 different milk foods
27 separate carbohydrate modifiers

Such a great abundance of preparations from which to choose can only be a tribute to the fact that, generally speaking, the problems of infant feeding have been solved. As Brenneman observed, "we have emerged from the chaos of complexity to the chaos of simplicity." The more or less feverish pitch with which proprietary firms promote their products usually depends on some more or less fastidious refinement of a basic pattern which serves all similar products. A recent trend which is spreading rapidly in popularity is the promotion of what Dr. Lee Forrest Hill calls the "one-formula

products," that is, those preparations which require only the addition of water to supply a complete formula containing twenty calories to the ounce, and usually simulating the composition of breast milk. Such preparations possess the advantage of ease of preparation and standardization and thus represent a further step in simplification of feeding. Furthermore, they have been widely and successfully used. The chief disadvantages are expense, lack of adjustability to individual needs and, above all, the fact that such "shotgun" or packaged mixtures do not test or exercise the thinking and knowledge of the physician who prescribes them.

An additional index of the great advancements which have been made is the fact that the basic needs and supplies have been so well worked out that a great deal of *faddism* characterizes modern feeding techniques. The age which solid foods are first fed is a good example:

35 years ago—solids were added continuously during the latter part of the first year.
25 years ago—under the influence of Marriott, addition of solid foods by the age of six months was advised.
15 years ago—it gradually became customary to add solids at least by three months of age.
Now—the average age of first feeding of solids is probably two months, but it is not unusual to see solids regularly started within the first week or to read where physicians boastfully report the successful addition of cereals, fruits, vegetables and meat within the first four weeks of life.

Although there can be little question that introduction of solids is occasionally indicated, there is likewise little question that no nutritional or psychologic advantage to the infant derives from the introduction of solid foods before the second or third month of life.[2,3] In this connection, it is also apparent that there is a widespread tendency to overfeed with milk mixtures that are too potent in calories. There are circumstances when more than 20 cal./oz. are required, but they are few and, as will be emphasized later, mixtures containing 20 cal./oz. provide an optimum water intake while providing adequate protein and calories. Finally, an even more striking example of faddism is the growing popularity of feeding an infant entirely by cup.

Such accomplishments only demonstrate, as do so many reports in medicine, what one "can get away with." They are usually motivated by the desire for "bigger and better babies," but it should be remembered that gain in weight is not necessarily the best criterion of optimum health in a baby.[4]

Another and perhaps more serious manifestation of refinement in feeding is the promotion of a wide variety of growth-stimulating substances and the alacrity with which proprietary companies pounce on any evidence, however meager, that a particular substance stimulates appetite or growth as an excuse for immediate production and intensive promotion. Various and highly expensive combinations of tranquilizers, vitamins, hormones, aminoacids and minerals result. Notwithstanding the immense indebtedness of American medicine to the remarkable achievements of the pharmaceutical industry, it behooves every physician to scrutinize carefully each product brought to his attention.[5] Table I summarizes some of the undesirable trends in infant feeding.

Thus, the simplicity of feeding today, so astonishing in comparison to the not too distant past, finds expression in the great variety of products available and regimens used. The wide margin of safety attests to the basic foundation of principles of infant feeding and, of course, to the capacity of the human infant to adjust to wide variations. It also makes possible the fact that faddism in feeding has not proved more harmful than it has. Dr. L. Emmet Holt has expressed the modern challenge in infant feeding as follows:[6,7]

1. Having placed infant nutrition on a sound basis, we are now striving for perfection, not just success.
2. Although we have mastered nutrition in health, nutrition under stress of disease is another matter. Frequently, a regimen which is quite satisfactory for a well baby may impose a handicap to a sick baby if it is not suitably altered. Perfection in the understanding of feeding normal babies will aid in the management of sick babies.

Prenatal Factors

Any campaign to understand and improve nutrition of infancy should begin with the study of the prenatal period. Nutritionally, an infant is nine months old at birth. The diet and general health status of the pregnant woman is highly important to the nutritional status and requirements of the neonate. This is particularly true of the premature infant and of multiple births. The very rapid growth of the fetus during the last trimester of pregnancy is well known and the major (approximately two-thirds of the total) storage of such critically important substances as nitrogen, calcium, phosphorus and iron occurs during this period.

Calcium and phosphorus retentions tend to be rather poor after birth,[8] and in the case of prematures, stores of these minerals are so inadequate and

requirement for rapid growth so great that the tendency for rickets can only be avoided by early provision of vitamin D within the first two weeks, particularly in infants fed breast milk. The importance of adequate vitamin D and calcium intake of the mother in this connection becomes especially apparent.

Likewise, the iron content of the fetus at birth depends on maternal intake and will be dangerously low in premature births. Whereas there is no real agreement as to when iron supplementation should be begun in such instances, early provision, perhaps by the end of the neonatal period, is important to make iron available when the infant needs it later (at about 100 days) when erythropoietic activity returns.[9]

It is no longer customary to give vitamin K to the pregnant woman for several days prior to delivery or by injection just before delivery, although the prothrombin level of the newborn can be elevated by this means, and it has been suggested that vascular integrity is also strengthened. Poor maternal diet exaggerates the neonatal drop in prothrombin level. The administration of vitamin K to the newborn has been stated to be ineffective in the prevention of hemorrhagic disease.[10,11] Recent extensive and well controlled studies indicate that vitamin K given to the mother or to the infant after birth is of definite value in the prevention of mortality due to hemorrhagic disease.[12] Plum has estimated that in Sweden, with 100,000 full-term births each year, 150 infant deaths from hemorrhagic disease are prevented by the prophylactic administration of 1 mg. of vitamin K to the neonate.[12] This estimate was based on observations in 17,740 infants who did not receive vitamin K and 13,250 who did.

Caution in the dosage used in the infant is dictated by the well-documented toxicity of synthetic analogues of vitamin K on red blood cells, causing hemolysis and hyperbilirubinemia,[13,14] particularly in premature infants. Many cases of kernicterus have been described. This iatrogenic complication results from use of excessively large doses of this vitamin, despite the early demonstration that very small amounts are required. Recently, it has also been reported that large amounts of vitamin K analogue given parenterally to the mother prior to delivery causes marked hyperbilirubinemia in premature infants within the first forty to seventy-two hours of life.[15] It is recommended that no more than 1 mg. vitamin K (for example, Synkavite®) be given routinely by intramuscular injection to the newly born infant.

Time of First Feedings

Certain aspects of the first few days of life deserve special mention. As is true of all mammals, heat production is relatively very low immediately after birth in comparison to later infancy (one-half or less), in relation to body surface. Consequently, calorie and water requirements are likewise low during this period. In addition, newborn infants, especially prematures, possess an enlarged extracellular space (excess sodium and water), the loss of which accounts largely for the physiologic weight loss. When one considers these facts, it is clear that there need be no compulsion regarding early feeding of newborn infants. Indeed, nothing need be given for the first forty-eight hours or so, if there is an indication for allowing a baby complete rest, as there frequently is following traumatic labor or delivery. In this connection, knowing the tendency toward respiratory complications in the premature, a certain delay in feeding is advisable. Also, breast feeding can be given a better trial if there is no urgency or compulsion regarding early provision of full strength feedings for the first few days. Dr. Clement Smith has aptly observed that more mistakes are made by feeding the infant too much or too early than too little or too late.

Renal Handicaps Affecting Nutrition

A great deal of attention has recently been focused on the important relationship between the limitations of renal function in infants and the desirable composition of artificial milk mixtures. These limitations are much more pronounced and important during the neonatal period than during later infancy.

Long before much was known about physiology of the newborn, it had been deduced on empirical and teleological grounds (at least by early 1800's) that cow's milk required modification in order to be "humanized." It gradually became accepted that cow's milk could best be adapted for use in human infants by the steps of alteration of protein (heat, acidification), dilution and addition of carbohydrate. The striking advances in processing and packaging during the past several decades soon made it apparent that the vast majority of infants could tolerate undiluted, unsweetened cow's milk or evaporated milk mixed with equal amounts of water. The use of such feedings spread and led, in

turn, to the frequent use of "super" formulas high in caloric, protein and carbohydrate content. Again, with the passage of time, it has become apparent that although there are indeed exceptions, there is little advantage to the use of "souped-up" formulas and, during the neonatal period, there are distinct disadvantages. As has been pointed out, weight gain has serious limitations as a criterion for optimal growth.

TABLE II. COMPOSITION OF MILKS

(After Gamble[14])

HUMAN MILK: total solids 12.5 gm/100 ml			
Fat	28%	Energy	88%
Sugar	60%		
Protein	10%	Structure	12%
Salts	2%		
COW'S MILK: total solids 13.0 gm/100 ml			
Fat	31%	Energy	67%
Sugar	36%		
Protein	27%	Structure	33%
Salts	6%		

One of the best rather early analyses of the nutritional qualities of human and cow's milk is a report of Dr. J. L. Gamble many years ago.[16] He divided food requirements into requirement for energy and requirement for structural materials. From Table II, it can be seen that, although both milks have essentially the same total solids content, cow's milk has three times as much structural material and 25 per cent less energy. He pointed out the logic of reducing excessive intake of structural material and increasing energy by the process of dilution and addition of carbohydrate. At the time, it was still believed that cow's milk protein was inferior to human protein, and dilution of protein to levels approaching that of human milk was not advised. Dr. Gamble also predicted that the large mineral load in cow's milk would bear worrying about.

In recent years, progress in understanding of renal limitations (particularly during the newborn period) has been largely responsible for re-establishing the advisability of an old procedure in accordance with new evidence:

1. Dilute cow's milk to reduce mineral content.
2. Add carbohydrate to fortify energy content and spare protein.
3. Serve in concentration similar to that of breast milk (20 cal./oz. or 100 cal./150 ml.)

Table III summarizes the important renal handicaps of the newborn:[17-20]

1. Glomerular clearance of electrolytes (for example sodium, chlorine, urea, phosphates and organic acid) is reduced to about one-third to one-fifth adult values on basis of surface area. This accounts for the strong tendency to retain sodium and water. The retention of chlorides and organic acids may contribute to acidosis. Excessive protein intake also predisposes to acidosis by increasing anion load (sulfates and phosphates).

2. Tubular reabsorption of water is sharply limited during the newborn period, resulting in relative inability to concentrate urine. This plus decreased glomerular clearances results in the production of a dilute urine. Twice as much water is required to excrete solute in an infant as compared to an adult (1.4 to 2.0 ml./mOsm as compared to 0.7 ml./mOsm). The feeding of a formula with high protein and mineral content consequently increases greatly the need or demand for urine water to excrete the great osmolar load. Unmodified mixtures can increase solute load as much as 85 per cent and renal water requirement by 100 per cent. Because solutes claim water for urinary excretion, extrarenal losses of water cannot be met by appropriate renal concentrations and water balance becomes precarious, with a tendency for hyperosmolarity and heat prostration.

3. Tubular recovery of base and manufacture of ammonia are also inadequate. High protein loads are also acid loads and the tendency to acidosis is thus further aggravated.

TABLE III. RENAL HANDICAPS AFFECTING NUTRITION

Glomerular	decreased filtration decreased mineral clearance tendency retention electrolytes (Na) & H_2O
Tubular	decreased water reabsorption inability to concentrate 700 = over 700 mOsm/L tendency to dehydration poor recovery of base tendency acidosis

Renal water requirement high (NB twice older infant)
Intolerance to solute and/or water load

Thus, whereas the normal infant can adapt to wide variations in protein, fat and carbohydrate content of mixtures, the infant fed unmodified cow's milk under stress of increased extrarenal water loss (high environmental temperature, fever, gastrointestinal upset, decreased intake) cannot conserve water because, as a result of the mineral content of "straight" cow's milk, the kidneys are already operating at approximately maximum capacity for tubular reabsorption or urinary concentration. In order to protect the occasional infant with such a problem, that is to buttress his adaptability to dehydration hazards, all neonates, especially, should be provided a mixture which will satisfy not only protein and caloric needs and appetite, but will also provide a low osmolar load which will spare renal water. These needs are met by a standard one to two dilution of evaporated milk with water and the addition of 5 per cent carbohydrate by weight. They are also met by several of the "one-formula" products available. Such mixtures provide more than ample provision of protein.

Because all of the described limitations of renal function are most pronounced in the immediate

postnatal state, the wisdom of providing a low calorie, low electrolyte fluid is apparent. The tradition of using a very dilute mixture for the first several feedings is thus substantiated.

Neonatal Tetany

This complex disorder is directly related to limitation of renal function in the neonate. It occurs with variable frequency during the first few days or weeks of life. Although classically characterized chiefly by convulsions, the clinical picture also consists of irritability, hypertonicity, colic, twitching, carpopedal spasm and laryngospasm. It is due to a combination of factors which result in hypocalcemia (usually below 8 mg. per cent or 4 mEq/L).

It has long been known that hypocalcemia frequently occurs in newborn infants, both premature and term. The level is lower and fluctuates more widely in prematures than in term infants.[21] In recent years, evidence has accumulated which indicates that hypocalcemia commonly occurs during the first day of life, frequently associated with "typical" tetany, and that there is a direct association with complications of pregnancy, labor and delivery, implying an influence of "stress" on calcium metabolism.[21,22] Such maternal complications or stresses as prematurity, diabetes mellitus, caesarean section, breech delivery, toxemia were associated with hypocalcemia on the first day of life. In addition, a particular syndrome of pronounced neuromuscular irritability associated with hypocalcemia has been reported in a number of infants, both premature and term, born of complicated pregnancy, labor or delivery.[23]

TABLE IV. MINERAL CONTENT OF HUMAN AND COW'S MILK
(National Research Council, 1953)

	Human mg./100 ml.	Cow's mg./100 ml.
Total minerals	210	720
Calcium	33	125
Phosphorus	15	96
Ca:P	2.2	1.3

The usual or "typical" case of neonatal tetany does not occur during the first few days of life and occurs particularly in infants fed cow's milk. Four factors are apparently involved: (1) reduced renal clearance of phosphorus, (2) high phosphorus load of cow's milk, (3) probable transitory hypoparathyroidism, and (4) some predisposing factor such as unusually pronounced renal handicap, prematurity, etc.

As can be seen from Table IV, cow's milk contains over three times as many minerals, four times as much calcium, and six times as much phosphorus as does human milk. The excessive phosphorus content and reduced Ca:P ratio tend to disturb the reciprocal relationships between calcium and phosphorus with resultant tendency to hypocalcemia and convulsions. Table V summarizes the mechanisms involved and the sequence of changes which result in tetany. The tendency for hyperphosphotemia due to loading is sharply accentuated by the previously described reduced glomerular clearance. In addition, it appears that transitory, "physiologic" hypoparathyroidism further influences the development of hyperphosphotemia and hypocalcemia. Histologically, the parathyroid glands of the neonate apparently are normal from immediately after birth to approximately seventy-two hours;[26,27] after this time the picture is usually one of hyperplasia,[26-28] particularly in those infants fed cow's milk preparation. This hyperplasia represents a compensatory reaction to the phosphorus load and although it has been shown that an increased phosphorus excretion occurs,[25] the reaction is inadequate to produce a fall in the serum phosphorus[27,29] and has been termed "inadequate compensatory hyperplasia."[30]

TABLE V. MECHANISMS INVOLVED IN NEONATAL TETANY
(After Barnett[25])

High phosphorus intake—all infants on cow's milk
Low phosphorus excretion
- Low glomerular filtration rate
- Transitory hypoparathyroidism

Elevation of serum phosphorus
Reciprocal lowering of serum calcium
Tetany—in some infants
- "Stress factors"

The reciprocal lowering of calcium would then tend to produce tetany in only a certain proportion of infants, apparently those subject to predisposing factors such as prematurity, diabetic mother, stressful labor, *et cetera.* Awareness of the broad spectrum of clinical signs of hypocalcemic tetany will alert the physician to early recognition and therapy. In this connection, the diagnosis of neonatal tetany, especially if occurring very early after birth, should arouse suspicion of maternal hyperparathyroidism. Several instances of this association have been reported and the retrospective diagnosis of maternal hyperparathyroidism made possible.[29,31-33]

Treatment involves reduction of the phosphorus load, usually by formula dilution, and the administration of calcium salts intravenously and/or orally. Dilution of cow's milk does not alter the Ca:P ratio but it does reduce the phosphorus load which may then be more adequately handled by the kidney. Cow's milk diluted 1:2 with water

plus 10 per cent carbohydrate would be a suitable formula and, with added calcium gluconate, has been recommended for routine use during the first week or so of life, where breast feeding is not possible.[33]

Vitamins

Attention has already been directed to the fact that present-day infant feeding owes much of its success to the increased understanding of vitamins. Needless to say, progress in the study of these substances continues daily. However, the profusion of available commercial preparations with an apparently infinite variety of composition, and the frenetic promotion to which both the laity and the medical profession fall prey, result in wastefulness which is not only unscientific but occasionally deleterious. Although supplementation of the diet with certain vitamins is essential during especially the neonatal period and infancy, there seems little doubt that the packaging of vitamins available for common use makes it difficult not to supplement with too many vitamins and/or too much of certain ones.

Vitamin C is usually prescribed within the first week in amounts of 30-50 mg. daily to all newborns, although the former figure is closer to the actual requirement.[35] Supplementation is not strictly necessary in breast-fed infants of well-fed mothers, but is probably advisable. Breast milk contains about 50 mg. vitamin C per 1000 ml., whereas cow's milk contains less than one-third of this amount. In addition to its importance in the prevention of megaloblastosis and scurvy, ascorbic acid is needed in the premature infant and in some term newborns to permit complete metabolism of certain amino-acids, especially phenylalanine, an essential amino acid.[36] Because of variations in quality of orange juice and frequency of poor tolerance, the use of orange juice has largely been replaced by ascorbic acid as included in polyvitamin preparations. In this connection, a recent report indicates that dilution of vitamin C with boiling water exerts no harmful effect on vitamin C content and boiling results in loss of only 25 per cent of the vitamin C-containing substances.[37] The incidence of scurvy appears to have increased during recent years.[37,38]

Vitamin D should be begun by the end of the first week because both human and cow's milk contain negligible quantities of this substance and because of the great demands of rapid growth and the tendency for low retention and consequent depletion of calcium after birth.[8] The amount of supplement recommended is 400 U.S.P. units daily for both breast-fed and artificially-fed neonates; premature infants should receive 1000 units as a daily supplement. Although there is considerable variation in individual tolerance to large doses of vitamin D, a daily intake above 1500 units in a normal infant will produce signs of toxicity such as anorexia, irritability, failure to thrive.[39] When one takes into account the widespread practice of fortification of foods, especially milk preparations and cereals, with vitamin D, the proclivity of the physician to prescribe and the mother to give, larger than necessary amounts of supplement can easily lead to overdosage. Very large intakes produce the typical clinical picture of hypervitaminosis D.[40] In other instances, unusual sensitivity to vitamin D, not necessarily given in excess, leads to a similar, self-limited syndrome which can supervene quite early in infancy.[41]

Vitamin A is also traditionally begun by the end of the first week, despite the fact that milk is fairly rich in this substance (human 1766 units/L, cow's 1133/L), and supplementation is not really necessary. The amount recommended is 1500 I.U. daily and should be continued at least for the first few weeks.

Vitamins of the B complex have always been considered to be adequately supplied in milk, and no supplement is required, certainly during the neonatal period. Thiamine is easily destroyed if excessive heating of the milk is carried out. Recently, a new syndrome was described and shown to be due to deficiency of pyridoxine (Vitamin B_6).[42] It consisted of increased irritability, "gastrointestinal distress," exaggerated startle response and convulsions. Although milk contains adequate amounts of this vitamin (human 110 gamma/L, cow's 480 gamma/L), it was discovered that the great majority of babies were receiving a proprietary liquid milk in which the pyridoxine had been reduced by heat. The resulting symptomatology, however, represented a marginal deficiency, since the full-blown picture of B_6 avitaminosis was not described. Because of this and because the incidence of convulsions in infants fed this milk preparation was actually quite low, it is probable that some predisposing factor(s)[43-46] must be present, namely:

1. Poor endowment from mother plus poor dietary supply.

2. Inherent need for higher intake of vitamin B_6 on the basis of "pyridoxine dependency" in infants whose mothers ingested large amounts of the vitamin during pregnancy.

3. Inherent need for higher intake of vitamin B_6 on the basis of an idiopathic metabolic aberration.

4. Reduced threshold to convulsions due to inherent factors or to reduction in magnesium and calcium retentions.

Thus, convulsions associated with need for administration of pyridoxine can occur during the neonatal period in both breast and bottle-fed babies, and not necessarily associated with the relative lack of pyridoxine in the milk ingested. Awareness of this possibility is of the greatest importance in the differential diagnosis of convulsions during early infancy because of relative simplicity of treatment. Because of occasional anomalous requirements, a dose of 5-10 mg. of pyridoxine hydrochloride should be given in therapeutic trial to any infant with convulsions of unknown etiology.

The actual optimum or recommended requirement for vitamin B_6 has not yet been securely established. The human infant is very sensitive to B_6 deficiency, since over forty enzyme systems are dependent on this vitamin. Exact requirement varies from patient to patient, but is at least 0.1 mg. daily on regimens providing maximal utilization. The usual evaporated milk mixture provides 0.2 to 0.3 mg. daily and this has been recommended as the minimum requirement for early infancy.[46] Perhaps a level of 1 mg. daily should be suggested, since the above figure does not represent a wide margin of safety.

Vitamin E requirements have not been established. It has been known for some time that the serum levels of these hormones are low at birth and increase rapidly in breast-fed and much less so in bottle-fed infants,[47] indicating poor placental but excellent mammary transfer. The recent work of Gordon and associates,[48-51] utilizing the erythrocyte hemolysis test in hydrogen peroxide, indicates a deficiency of tocopherol in newborn infants, both full-term and premature. There have been no clinical correlates of this laboratory evidence of deficiency, which is easily remedied by breast-feeding, less easily by whole cow's milk and not at all by skim milk. This evidence of vitamin E deficiency is particularly prominent in premature infants. They suggest that such infants may require daily supplementation in amount of 0.5 mg/kg. but reserve definite recommendation until positive clinical evidence of a deficiency state can be ascertained.

Amino Acids

Requirements for specific amino acids are gradually being established and little can be said here that is pertinent to the newborn infant. Mention should be made of the inadvisability, in the light of present knowledge, of the fortification of milk with lysine in order to promote increase in appetite and weight gain. There has been much to do about this, but it is apparent that such supplementation may actually be hazardous, since intake of a balanced mixture of amino acids is more important than fluctuations in individual amino acids.[52] The "band-wagon" enthusiasm with which several proprietary companies have peddled such supplements indicates how greatly the motive for profit can exceed the motive to profit.

Recently, several reports have demonstrated that the hereditary "inborn error of metabolism" known as phenylpyruvic acid oligophrenia can be significantly improved by eliminating phenylalanine from the diet.[53] The disorder occurs once in approximately every 25,000 births. Routine testing of the urine of newborns with 5 per cent ferric chloride to identify the phenylpyruvic acid has been instituted in many areas. The test can also be performed on a diaper. The test may not become positive until the end of the first month, and will therefore have to be repeated if the index of suspicion is high. A much simplified test has recently been described.[54] Awareness of this disorder represents an opportunity to remove one more specific entity from the large group of unknown causes of mental retardation.

Galactose Disease

This is a serious disease which manifests itself during the neonatal period and which, if identified early, can be completely prevented by eliminating galactose from the diet. It is a hereditary disorder caused by an inborn error of metabolism which causes an inability to metabolize galactose normally and results in a spectrum of signs and symptoms among which are persistent jaundice, vomiting, diarrhea, hepatosplenomegaly, cirrhosis, cataracts, renal damage and mental retardation.[55] Suspicion will lead to testing the urine for reducing substance; glucosuria and diabetes mellitus can be eliminated by use of glucose oxidase which has been incorporated in indicator papers

(for example Tes-tape®) and which identifies glucose only.

Essential Fatty Acids

Hansen and associates have recently reported a series of experiments with the extended feeding of diets extremely low in fat to healthy neonates.[56-59] It was found that spontaneous caloric intake was sharply increased in order to maintain weight gain of control infants. The addition of linoleic acid resulted in 20 to 40 per cent reduction in caloric intake, but in an unchanged growth curve, indicating indirectly that deficiency of linoleic acid elevates the basal metabolic rate in infants as it has long been known to do in a variety of experimental animals. The increased ratio of caloric intake/weight gain thus induced not only results in inefficient caloric utilization, but in an increased solute load as well. In addition to the increased caloric requirement, the following signs and symptoms were noted in these infants: frequent large stools, perianal irritation, dermatitis (especially in the Negro infant). These were likewise reversible with the addition of linoleic acid. It was concluded that these manifestations were prevented when the diet contained at least 1 per cent of the calories as linoleic acid, as is provided by the usual evaporated milk formulas. An intake of 4 per cent of the calories as lineolic acid was considered optimum for the healthy young infant.

This evidence should do much to diminish the feeding of low-fat milk mixtures to young infants, both term and premature. Although it is true that premature infants assimilate cow's milk fat less well than term infants, it is also apparent that the great majority of these infants tolerate very well a large number of full-fat evaporated milk preparations and that full-fat feedings result in retention and assimilation of the fat, although a significant proportion is lost in the stool.[60] Also, there are several proprietary preparations of cow's milk in which the butterfat has been replaced with more readily assimilable and more highly unsaturated vegetable oils.

Conclusion

The specialized nutritional requirements of the neonate are directly related to the physiologic and metabolic immaturity which characterizes his developmental status and to the handicaps thus imposed during the process of postnatal adaptation. These handicaps become more threatening under the burden of perinatal stress factors, including prematurity, caesarean section, diabetic mother, breech delivery. In addition, these special considerations must subserve the demands for rapid growth.

Improved knowledge about the infant and his needs makes it abundantly clear that breast feeding is the ideal regimen for a neonate. Failing that, the simplest artificial feeding regimen employing the principle of humanization of cow's milk should be instituted in order to contend with the special problems incident to the composition of cow's milk and the immature renal function of the neonate. Vitamin supplementation is essential only for C and D, optional for A and unnecessary for members of the B complex, except in special circumstances. Vitamin K, 1 mg., should be given at the time of birth. Vitamin E may be required for the premature infant. There is no virtue in the routine introduction of solid foods before two to three months. "Special" vitamins and additives to stimulate appetite and growth should be avoided. Convulsions due to B_6 deficiency, onset of phenylpyruvic oligophrenia and galactosemia may occur during the neonatal period and early identification depends on heightened awareness. The importance of essential fatty acids in infant feeding is becoming increasingly apparent.

Bibliography

1. Meyer, H. F.: Essentials of Infant Feeding for Physicians. Springfield, Illinois: Charles C Thomas, 1952.
2. Deisher, R. W., and Goers, S. S.: A study of early and later introduction of solids into the infant diet. J. Pediat., 45:191, 1954.
3. Beal, V. A.: On acceptance of solid foods and other food patterns of infants and children. Pediatrics, 20:448, 1957.
4. Forbes, G. B.: Do we need a new perspective in infant nutrition? J. Pediat., 52:496, 1958.
5. May, C. D.: Education, communication and promotion. Pediatrics, 18:855, 1956.
6. Holt, L. E., Jr.: Foreward, Modern Trends in Infant Nutrition and Feeding. J. T. Lanman, Sugar Research Foundation, Inc., New York, 1952.
7. Holt, L. E., Jr.: Nutritional requirements in early life. Pediatrics, 17:578, 1956.
8. Stearns, G.: Maternal nutrition and child health. Bulletin of the National Research Council, No. 123, National Academy of Science, Washington, 1950, p. 57.
9. Wintrobe, M. M.: Clinical Hematology. Philadelphia: Lea and Febiger, 1956.
10. Potter, E. L.: Effect on infant mortality of vitamin K administered during labor. Am. J. Obst. & Gynec., 50:237, 1945.
11. Sanford, H. N., Kostalik, M., and Blackmore, B.: Prothrombin studies on the blood of the premature infant and the value of vitamin K therapy. A.M.A. J. Dis. Child., 78:686, 1949.
12. Plum, P., and Lehmann, J.: Infant Metabolism. New York: Macmillan Company, p. 181 et. seq., 1956.

13. Meyer, T. C., and Angus, J.: Effect of large doses of synkavite in the newborn. Arch. Dis. Child., 31:212, 1956.
14. Asteriadou-Samartizis, and Leikin, S.: Relation of vitamin K to hyperbilirubinemia. Pediatrics, 21: 397, 1958.
15. Lucey, J. F., and Dolan, R. G.: Hyperbilirubinemia of newborn infants associated with the parenteral administration of a vitamin K analogue to the mothers. Pediatrics, 23:553, 1959.
16. Gamble, J. L.: The general terms of the food requirement. Brenneman: Practice of Pediatrics. Hagerstown: W. F. Prior Co., Inc. Vol. 1, ch. 23.
17. McCance, R. A.: Renal function in infancy. Am. J. Med., 9:229, 1950.
18. Barnett, H. L., and Vesterdal, J.: The physiological and clinical significance of immaturity of kidney function in young infants. J. Pediat., 42:99, 1953.
19. Pratt, E. L., and Snyderman, S. E.: Renal water requirement of infants fed evaporated milk with and without added carbohydrate. Pediatrics, 11:65, 1953.
20. Darrow, D. C., Cooke, R. E., and Segar, W. E.: Water and electrolyte metabolism in infants fed cow's milk mixtures during heat stress. Pediatrics, 14:602, 1954.
21. Bruck, E, and Weintraut, D. H.: Serum calcium and phosphorus in premature and full-term infants. Am. J. Dis. Child., 90:653, 1955.
22. Gittleman, I. F., Pincus, J. B., Schmerzler, E., and Saito, M.: Hypocalcemia occurring on the first day of life in mature and premature infants. Pediatrics, 18:721, 1956.
23. Craig, W. S.: Clinical signs of neonatal tetany: with special reference to their occurrence in newborn babies of diabetic mothers. Pediatrics, 22:297, 1958.
24. Craig, W. S., and Buchanan, M. F. G.: Hypocalcaemic tetany developing within 36 hours of birth. Arch. Dis. Child., 33:505, 1958.
25. Barnett, H. L.: Infant metabolism. New York: The Macmillan Company. p. 427 et. seq., 1956.
26. Kaplan, E.: Parathyroid gland in infancy. Arch. Path., 34:1042, 1942.
27. Gardner, L. I.: Tetany and parathyroid hyperplasia in the newborn infant: influence of dietary phosphate load. Pediatrics, 9:534, 1952
28. Mosca, L.: The parathyroid glands of the human newborn. Brol. Lat., 8:1331, 1955.
29. Talbot, N. B., Sobel, E. H., MacArthur, S. W., and Crawford, J. D.: Functional endocrinology from birth through adolescence. Cambridge: Harvard University Press, 1952
30. McCrory, W. W., and Barnett, H. L. Cited in reference 23.
31. Friderichsen, C.: Hypocalcemie bei einens Brustkind and Hypercalcemie bei der Mutter. Monatschr. f. Kinderh., 75:146, 1938.
32. Walton, R. L.: Neonatal tetany in two siblings: effect of maternal hyperparathyroidism. Pediatrics, 13:227, 1954.
33. Van Arsdel, P. P., Jr.: Maternal hyperparathyroidism as a cause of neonatal tetany: case report and review of 29 cases of parathyroid adenoma. J. Clin. Endocrinol. 15:680, 1955.
34. Gardner, L. I., MacLachlan, E. A., Pick, W., Terry, M. L., and Butler, A. M: Etiologic factors in tetany of newly born infants. Pediatrics, 5:228, 1950.
35. Council on Foods and Nutrition: Vitamin preparations as dietary supplements and as therapeutic agents. J.A.M.A., 169:41, 1959.
36. Levine, S. Z.: Tyrosine and phenylalanine metabolism in infants and the role of vitamin C. Harvey Lect., 42:1947.
37. Whelen, W. S, Fraser, D., Robertson, E. C., and Tomezak, H.: Rising incidence of scurvy in infants: challenge to physicians and community. Canad. M.A.J., 78:177, 1958.
38. Woodruff, C.: Infantile scurvy. J.A.MA., 161:448, 1956.
39. Jeans, P. C.: Feeding of healthy infants and children. Council on Foods and Nutrition, J.A.M.A., 142:806, 1950.
40. Way, W. G., Morgan, D. L. and Stone, L. E., Jr.: Hypertension and hypercalcemia nephropathy due to vitamin D intoxication. Pediatrics, 21:59, 1958.
41. Bongiovanni, A. M., Eberlein, W. R., and Jones, I. T: Idiopathic hypercalcemia of infancy with failure to thrive: report of three cases with consideration of possible etiology. New England J. Med., 257:951, 1957.
42. Coursin, D. B.: Vitamin B_6 deficiency in infants. Am. J. Dis. Child., 90:344, 1955.
43. Adams, D. J. D., Bessey, O. A., Bussey, D. R., and Hansen, A. E.: Vitamin B_6 requirements in relation to convulsive seizures in infants. Am. J. Dis. Child., 88:623, 1954.
44. Hansen, A. E., Wiese, H. F., Adam, D. J. D., Bessey, O. A., and Worsham, A. G.: Mineral balance changes induced by pyridoxine in infant receiving convulsigenic feeding mixture. Am. J. Dis. Child., 88:373, 1954.
45. Hunt, A. H., Jr.: Abnormally high pyridoxine requirement. Am J. Clin. Nutrition, 5:561, 1957.
46. Bessey, O. A., Adams, D. J. D., and Hansen, A. E.: Intake of vitamin B_6 and infantile convulsions: a first approximation of requirements of pyridoxine in infants. Pediatrics, 20:33, 1957.
47. Wright, S. W., Filer, L. J., and Mason, K. E.: Vitamin E blood levels in premature and full term infants. Pediatrics, 7:386, 1957.
48. Makenzie, J. B.: Relation between serum tocopherol and hemolysis in hydrogen peroxide of erythrocytes in premature infants. Pediatrics, 13:346, 1954.
49. Gordon, R. H., Nitowsky, H. M., and Cornblath, M.: Studies of tocopherol deficiency in infants and children. I. Hemolysis or erythrocytes in hydrogen peroxide. Am. J. Dis. Child., 90:669, 1955.
50. Nitowski, H. M., Cornblath, M., and Gordon, H. H.: Studies of tocopherol deficiency in infants and children. II. Plasma tocopherol and erythrocyte hemolysis in hydrogen peroxide A.M.A.J. Dis. Child., 92:164, 1956.
51. Gordon, H. H., Nitowsky, H. M., Tildon, B. S., and Levin, S.: Studies of tocopherol deficiency in infants and children. V. An interim summary. Pediatrics, 21:673, 1958.
52. Commentary: Use of amino acids as dietary supplements. Pediatrics, 17:965, 1956.
53. Wright, S. W., and Tarjan, G.: Phenylketonuria. Am. J. Dis. Child., 93:405, 1957.
54. Berry, H. K., Sutherland, B., Guest, G. M., and Warkany, J.: Simple method for detection of phenylketorunia. J.A.M.A., 167:2189, 1958.
55. Guest, G. M.: Hereditary galactose disease. J.A.M.A., 168:2015, 1958.
56. Hansen, A. E.: Essential fatty acids and infant nutrition. Pediatrics, 21:494, 1958.
57. Wiese, H. F., Hansen, A. E., and Adam, D. J. D.: Essential fatty acids in infant nutrition. I. Linoleic acid requirement in terms of serum di-, tri- and tetra-enoic acid levels. J. Nutrition, 66:345, 1958.
58. Adam, D. J. D., Hansen, A. E., and Wiese, H. F.: Essential fatty acids in infant nutrition. II. Effect of linoleic acid on caloric intake. J. Nutrition, 66: 555, 1958.
59. Hansen, A. E., Haggard, M. E., Boelsche, A. N., Adam, D. J. D., and Wiese, H. F.: Essential fatty acids in infant nutrition. III. Clinical manifestations of linoleic acid deficiency. J. Nutrition, 66:565, 1958.
60. Morales, S., Chung, A. W., Lewis, J. M., Messina, A., and Holt, L. E., Jr.: Absorption of fat and vitamin A in premature infants. I. Effect of different levels of intake on the retention of fat and vitamin A. Pediatrics, 6:86, 1950.

Villous Papillomas of the Rectum

A Review of Twenty-five Cases

● *Villous papillomas of the rectum and lower colon deserve consideration as distinctly different from the much more common adenocarcinomas and "benign" polyps of the colon.*

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Presented before the Minneapolis Surgical Society, May 1, 1958.

A BRITISH pathologist, Holmes, originated the term "villous papilloma" to distinguish it from the adenomatous type of polyp. This is a particularly useful classification for the clinician which allows him to consider the tumor as a separate entity, different from adenocarcinoma and the adenomatous polyp. The origin, characteristics, and potentiality of these tumors differ from other tumors of the colon. The characteristic difference between villous papillomas and ordinary adenomas is that the former are soft, velvety and impart to the examining finger the feeling of soft jelly. They are so soft, spongy and friable that it is not unusual to shear off a piece of the tumor during performance of a proctoscopic examination.

The mucosa surrounding the tumor may seem normal. On careful scrutiny, however, tiny papillations will be discovered which on microscopic examination can be identified as tiny, gross tumors. These papillations must be removed or destroyed with the tumor or recurrence is almost inevitable. The existence of this zone of tiny tumors is a strong argument in favor of prolonged follow-up study after treatment is completed.

(Turn to Page 107)

According to Dukes, villous papillomas are the end result of a growth pattern which affects mainly the superficial epithelium in contrast to the adenoma which is the result of a growth pattern affecting mainly cells of the deeper layers; increased muco-epithelial surface other than the glandular elements of the villous configuration tends to support this theory. Unlike ordinary adenomas, villous adenomas are seldom pedunculated. Usually they have a broad base and are fungating. The surface is wet and covered with a glairy mucus. The tumor is usually attached to the muscular layer of the bowel, unless invasive carcinoma is present. Villous tumors have a decided tendency to undergo changes characteristic of malignancy which usually is of low grade. Invasion takes place slowly and metastases occur late; usually spread occurs by direct invasion instead of by invasion of lymphatics, vascular, and nerve channels. Invasive carcinoma is observed in at least one out of ten tumors. This change to malignancy is almost always accompanied by alteration of the consistency of the tumor and a firm plaque or nodule is usually palpable. Thus, areas of induration or ulceration in villous tumors usually indicate malignant change.

Age

Villous papillomas are seldom seen in patients younger than forty years of age. The average age in Bacon's series is fifty-five years and in Sutherlands it is sixty-five years. Experience of others reveals that villous tumors are found more commonly in the older age groups.

Symptoms

The most common symptom is discharge from the rectum of large amounts of mucus stained with blood. Tenesmus and a feeling of incomplete evacuation are common and occasionally external prolapse, which may be mistaken for a prolapsed hemorrhoid, has been reported. It is quite significant that in cases of villous tumor of the rectum, signs and symptoms may be present for years, in contradistinction to most tumors of the bowel which undergo malignant change. This places emphasis on the benign nature of villous tumors. Villous papillomas are rare tumors. Until the turn of the century, few authors reported more than one or two such lesions in many years of surgical practice. Recently, larger series are being reported. Twenty-five villous papillomas have come under my observation since 1950. The youngest of my patients was thirty-five years and the oldest eighty-six—the average being sixty-six years. All of these tumors were discovered during proctoscopic examination, either in the rectum or the lower segment of the sigmoid. The size of the tumor varied from those which involved almost the entire circumference of the bowel to lesions 2 or 3 cm. in diameter.

Treatment

When surgery is under consideration, the actual bulk of the body of the tumor is unimportant. The extent of the attachment of the pedicle, or base, is the significant factor. Usually when the area of attachment involves half or less than half the circumference of the bowel lumen, excision *en masse* or fulguration can be accomplished. For the purpose of diagnosis, simple biopsy was worthless in nearly all of my cases. Specimens of tissue removed in this manner was invariably reported as benign. Tumors must be removed *en masse* and very carefully examined microscopically if one hopes to discover evidence of carcinoma. The pathologist's report, based on this study of bits of tissue removed from various parts of the tumor, was worthless. Of the twenty-five tumors thus observed, all but four were removed through the rectal outlet for total microscopic examination. In three of the four cases where the tumor was not removed in this manner, anterior resection and primary anastomosis were done. In these cases the tumor was not removed through the rectal outlet because the tumor was either situated too high or was too large. Because of the age of one patient, the tumor was destroyed by fulguration alone. Two of the tumors removed by anterior resection showed invasive carcinoma. Both occurred in young patients and both recurred one and three years after operation, respectively. Both patients have since died. Of the twenty-one tumors treated from below, twelve could be grasped through the dilated anal canal and excised *in toto*. Great care was taken to excise the tumor, including a margin of one-fourth to one-half inch of normal mucous membrane around it. If papillations remained, they were destroyed by fulguration. One tumor in a forty-seven-year-old white woman removed in this manner contained invasive carcinoma and abdomino-perineal resection was performed subsequently. The remaining eight tumors

were too bulky or too high in the rectum to adequately excise through the dilated anal canal. To facilitate exposure of the tumor, a posterior proctotomy was performed by splitting the anal sphincter muscles in the midline posteriorly and continuing the incision cephalad along the rectal wall. When necessary, the coccyx was excised. This allowed the entire rectum to be laid open and provided adequate room for excision of the lesion. Following resection of the tumor, the incision was carefully closed with chromic catgut. These incisions all healed primarily and no incontinence has resulted. Each of the eight patients was prepared carefully preoperatively with administration of Neomycin and Sulfasuxidine. Sulfasuxidine was given in dosages of 12 gm. daily for five days before the surgery and the Neomycin was given in dosages of 500 mg. every four hours, two days prior to surgery. At least two of the three patients had been told elsewhere that abdomino-perineal resection was necessary in their case. In three of the cases where tumors were removed from below, the pathologist reported invasive carcinoma in one, carcinoma *in situ* in two. One tumor showed invasive carcinoma and, as has been mentioned, was treated by abdomino-perineal resection. The other showed carcinoma *in situ* in only isolated foci of malignant change. This was not considered an indication for radical surgery. In one of those cases where actual carcinoma was found, radical surgery was employed. The patients who had tumors removed from below had been carefully followed by frequent proctoscopic examination. Wherever there was evidence of recurrence, tissue was carefully biopsied and the base thoroughly fulgurated. All have done well over a period of seven years. No treatment other than fulguration has been necessary. The only complication encountered was a slight stricture of the rectal ampulla where large amounts of tissue had been removed. Three patients developed contracture postoperatively but in each instance, this caused relatively little disability and responded to local dilatation.

Summary

In reviewing these twenty-five cases of villous papilloma, I wish to emphasize that villous papilloma should be regarded as malignant until proven otherwise. The only acceptable diagnosis of these lesions is one made by the pathologist's scrutiny of serial sections of the entire tumor. Carcinoma *in situ* is not included among those tumors which require radical surgery. Invasive carcinoma in a villous tumor must be treated as frank adenocarcinoma. This tumor may appear quite large and bulky and seems to present a serious problem on proctoscopic-anoscopic examination. By careful study, however, the base of the tumor may be found to involve only one-half or less of the circumference of the rectum and often it is not too difficult to excise such tumors from below. The conscientious surgeons should make every effort to eradicate these tumors by local means, resorting to radical surgery only upon necessity. It is not fair for the surgeon to assume that a tumor is malignant and subject his patient to abdomino-perineal resection until it is proved that invasive carcinoma is present. Unfortunately, in too many instances patients are treated by abdomino-perineal resection only to learn subsequently that examination of the tumor reveals, at worst, only isolated foci of non-invasive carcinoma.

Bibliography

Bacon, H. E., Lowell, E. J. and Trimpi, H. D.: Villous papilloma of the colon and rectum. Surgery, 35:77, (Jan.) 1954.

Burns, Francis J.: Papillomas of the colon and rectum. Am. J. Surgery, 80:97, (July) 1950.

Cripps, William Harrison: Diseases of the rectum and anus. Third edition. Chicago; W. T. Kenner & Co., 1907.

Fitzgerald, M. G.: Extreme fluid and electrolyte loss due to villous papilloma of the rectum. Case report. Brit. M. J., 1:831, (Apr. 2) 1955.

Gabriel, W. B.: The surgical management of large villous tumors of the rectum. Proceedings of Royal Society of Medicine. 45:696, (Oct.) 1952.

Hopping, Richard: Management of villous papillomas of lower portions of sigmoid and rectum. J. Internat. Coll. Surgeons, 25:374, (Mar.) 1956.

Lucas, Marvin A.: Villous tumors of the rectum and sigmoid above the peritoneal reflection. Trans. Am. Proctol. Soc., 52:539, 1953.

Lucas, Marvin A.: Villous tumors of the rectum and sigmoid colon above peritoneal reflection. Am. J. Surgery, 86:539, (Nov.) 1953.

Moran, Timothy: Surgical Treatment of Villous Tumors of the Rectum. Internat. Coll. Surgeons, 28:227, (Aug.) 1957.

Ryan, James E.: Villous Tumors of the Rectum Below the Peritoneal Reflection. Trans. Am. Proctol. Soc., 52:535, 1953.

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TUBERCULOSIS DEATH RATES, BY STATE AND TERRITORY, 1957

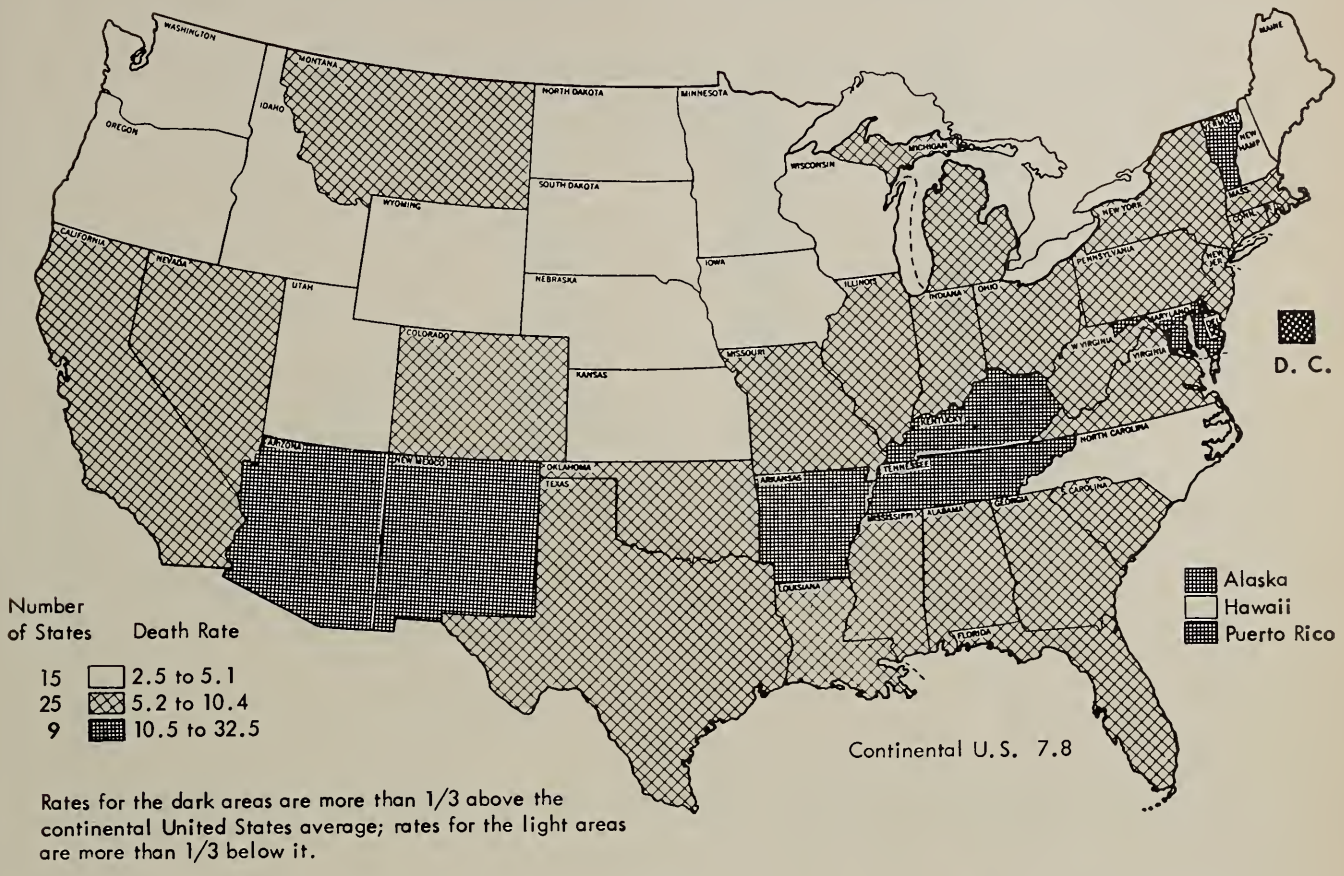


Fig. 1.

The Tuberculosis Problem Now

A Broad Perspective

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Presented at the Minnesota Public Health Conference, Minneapolis, Minnesota, September 25, 1959.
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TO THOSE FROM the rural areas of Minnesota, where tuberculosis rates are lower than was thought possible twenty years ago, the extent of this disease problem and the difficulties in planning efficient control measures may come as a surprise. The estimated figure for tuberculosis deaths in 1958 is 12,070. The number of reported cases for the same year was 83,400, of which 63,300 were active or probably active.

The statisticians of the Public Health Service and the National Tuberculosis Association estimated that in 1956 there were 250,000 active cases in the country, 150,000 of whom were known, and

that there were in addition 550,000 inactive cases in need of supervision. It was also estimated that there were 1,200,000 persons who had once had tuberculosis. This gives a grand total of 2,000,000 who have or have had tuberculosis. With fewer deaths in recent years in relation to new cases, there is some doubt that this total is decreasing very much.

RATES BY AGE, NEWLY REPORTED ACTIVE* TUBERCULOSIS CASES AND DEATHS
UNITED STATES, 1957

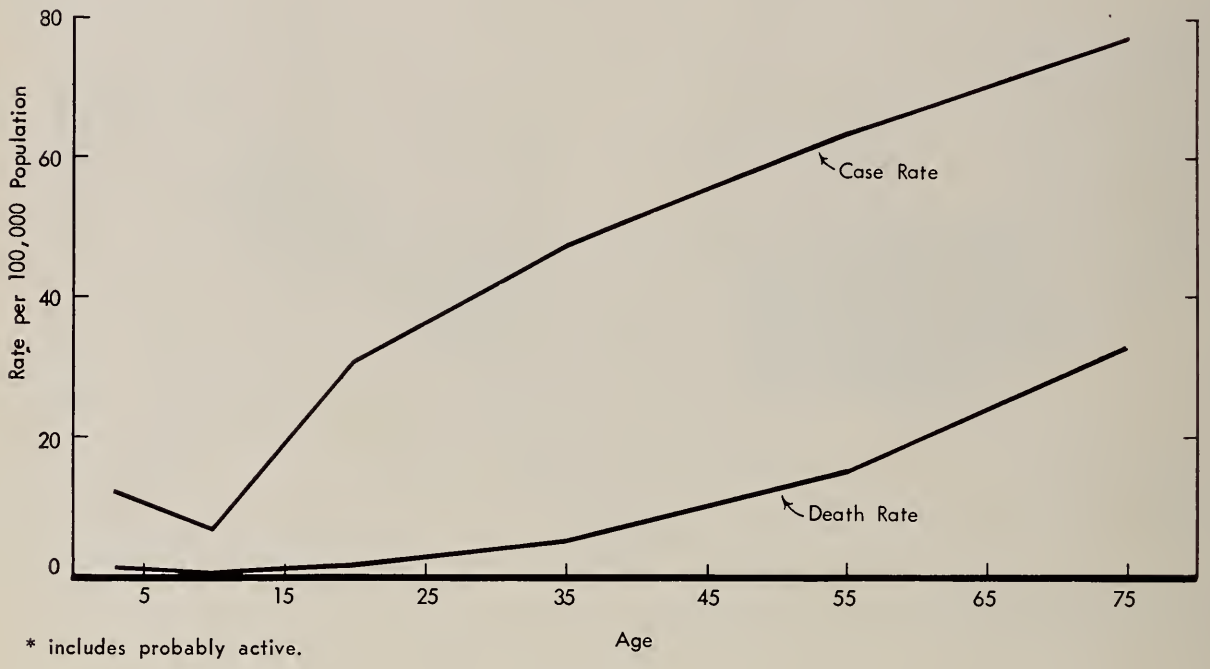


Fig. 2.

Compared with the figures of even ten years ago, these numbers seem small, but compared with those of other communicable diseases, they are still of first importance. Tuberculosis accounts for about as many deaths as all other infections and parasitic diseases combined.

The amount of money spent for tuberculosis control in this country has been increasing in recent years. The Public Health Service estimate for 1956, covering hospitalization and rehabilitation, compensation and public health measures for control, was $725,052,000. The comparable figure for 1952 was $621,023,000.

In years gone by, the situation was essentially a continuous emergency epidemic, and little attention was given to more precise evaluation of the problem in terms of individualized control methods. But now more individualized control is necessary to cut short a long period of rather slow progress.

To make a more direct attack on tuberculosis, we need to know where the disease is occurring, what kinds of people are suffering from it, how good our weapons are, and what trends are taking place. With this information, new strategy may be developed.

The disease is not uniformly distributed geographically. The current high mortality-rate area in this country is in the form of a band of states running from the Southwest to the mid-Atlantic section (Fig. 1). Incidentally, there is a close correlation between mortality, morbidity, and infection rates.

The geographic distribution can be narrowed still further by separating the urban and rural rates. In 1956, the death rate in cities of 500,000

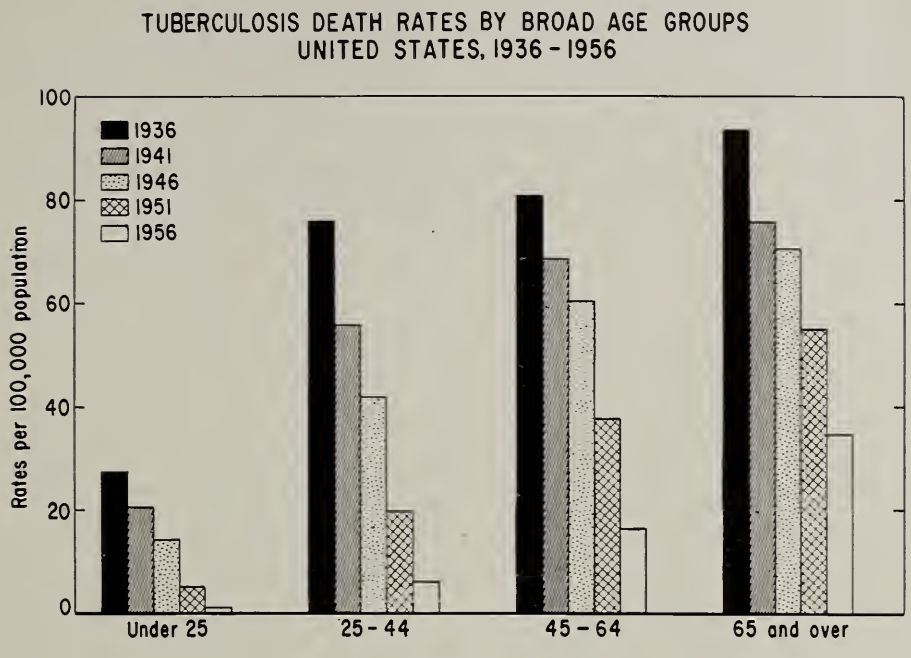

TUBERCULOSIS DEATH RATES BY BROAD AGE GROUPS
UNITED STATES, 1936 - 1956
Rates per 100,000 population
100
80
60
40
20
0
1936
1941
1946
1951
1956
Under 25
25 - 44
45 - 64
65 and over

Fig. 3.

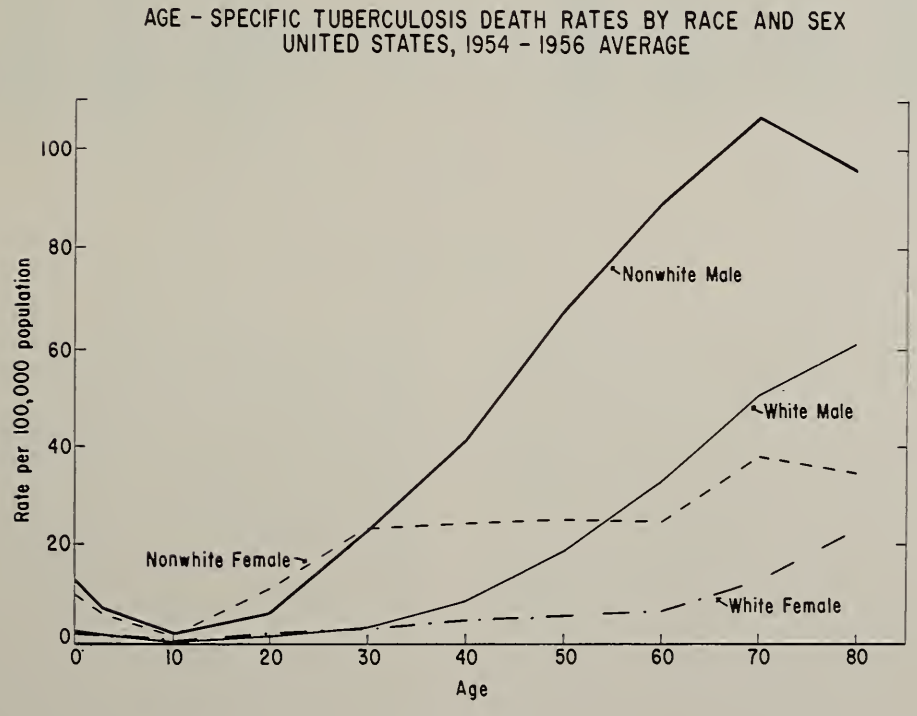

AGE - SPECIFIC TUBERCULOSIS DEATH RATES BY RACE AND SEX
UNITED STATES, 1954 - 1956 AVERAGE
Rate per 100,000 population
100
80
60
40
20
0
Nonwhite Male
White Male
Nonwhite Female
White Female
0
10
20
30
40
50
60
70
80
Age

Fig. 4.

population and over was 13.5, in cities of 100,000 and over it was 10.3, and in the rest of the country it was 6.8. In large cities the tuberculosis problem is highly concentrated in a few wards.

year the whole curve moves down to a lower level. The fifty-year-old people were subject to the fifty-year-old rate in 1957. In 1967, when they will be sixty years old, the point on the curve for the

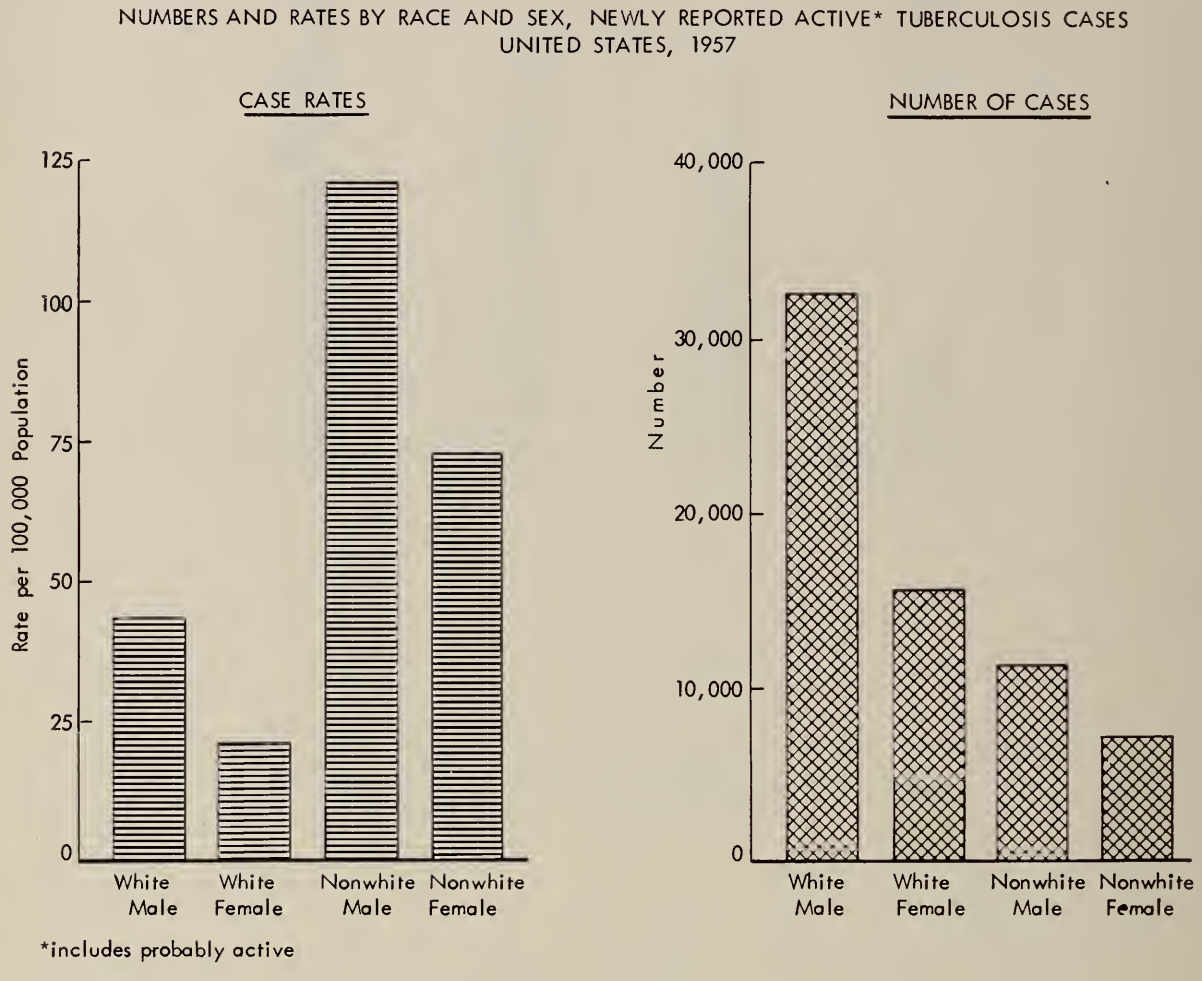


Fig. 5.

Knowing where the disease is most prevalent does not help much unless more information is available about the kinds of people likely to be affected. Traditionally, morbidity and mortality rates have been tabulated on the basis of age, sex, marital status, and ethnic background.

In 1957, the gross death rate for all ages was 7.8 per 100,000, but the death rates were higher in the older age groups and reached a high of 32.8 in people over sixty-five years of age. Case rates were also at high levels in the older ages (Fig. 2).

Paradoxically, this does not mean that people have higher rates as they advance in age. Each sixty-year-old people will have moved down to a point lower than the 1956 point for fifty-year-old people, provided that present trends continue.

People of average age thirty-five had a rate of 75.1 in 1936 (black bar, Fig. 3). Twenty years later, at average age fifty-five, they had a rate of 16.6 in spite of an apparent upward progression with age in any particular year.

Up to age thirty there is a marked difference by race, but not by sex. After that, the male rates rise rapidly for both white and non-white, and the female rates tend to remain level until age sixty (Fig. 4). All these rates are falling, the female rates faster than the male rates for both

white and non-white, so these differences by sex will likely be greater as time goes on.

Here again is something of a paradox in the difference between rates and numbers. The non-whites have the highest rates, but there are more rate areas and groups must not be forgotten.

Fortunately, our tools have been steadily improved. With the drugs now at hand, plus surgery, a good therapeutic result can be expected in over 90 per cent of all patients who do not have ex-

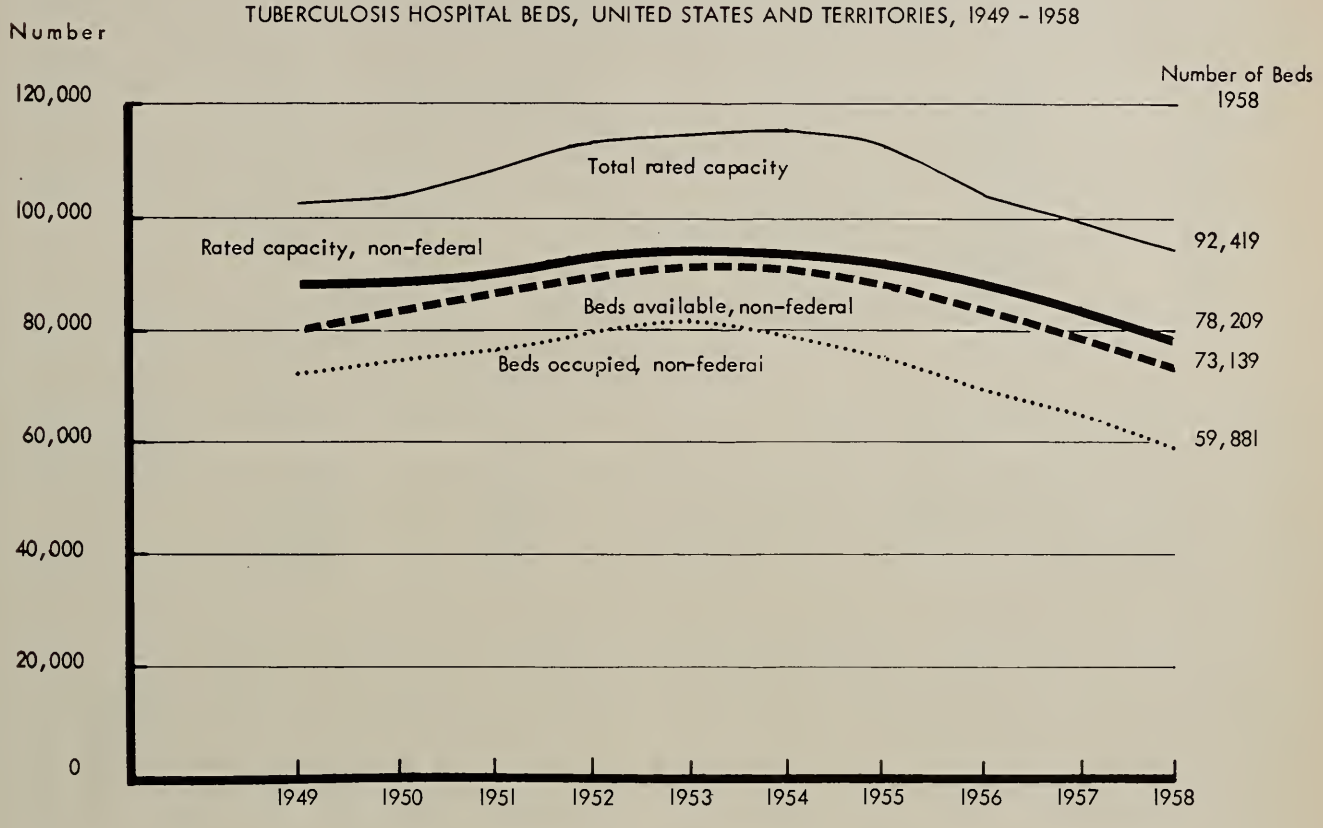


Fig. 6.

cases and deaths among the whites, simply because there are more white people (Fig. 5).

At this point one is tempted to conclude that tuberculosis is confined to a rather limited area of the country and to just a few segments of the population. The figures do indicate where and among whom the disease is more of a problem, but the distinction between rates and actual numbers must be kept in mind. For instance, even with the higher rates in older people, about half of all new cases occur among people under the age of forty-five. Cities of over 100,000 may have higher rates and actually account for 42 per cent of all deaths, but this means that 58 per cent of the deaths come from smaller cities and rural areas. Control efforts may be more efficient in high-rate areas, but the considerable number of cases in low-

tensive lung destruction and who receive a full continuous course of modern treatment. It should be noted that there are still only three major drugs in use, they must be given for long periods, and they do not eliminate all tubercle bacilli in the body. The disturbing facts are that over three-fourths of new patients have advanced disease and from 20 to 40 per cent do not receive adequate treatment. This results in treatment failures and relapses. Hospitals are now reporting that from 20 to 30 per cent of their admissions are retreatment cases. No one knows how many of these are treatment failures or how many are relapses. If we estimate that there are 250,000 active cases in the country and about 12,000 deaths a year, the fatality rate is about 4 per cent a year.

The number of admissions to hospitals is now

slowly declining, but the number of beds occupied has dropped a little more rapidly (Fig. 6). Until last year, most of the decrease in hospital bed occupancy was the result of shorter periods of hospital treatment rather than a fall in numbers of hospitalized patients. Total length of treatment per patient is probably not much shorter than in former years because drug therapy is usually continued for many months after discharge from a hospital. In most parts of the country, presumably, there are enough hospital beds.

TABLE I. TUBERCULOSIS DEATHS IN THE UNITED STATES

Year	Number	Decline
1946	50,911	3.8
1947	48,064	5.6
1948	43,833	8.8
1949	39,100	10.8
1950	33,959	13.1
1951	30,863	9.1
1952	24,621	20.2
1953	19,544	20.6
1954	16,392	16.1
1955	14,940	8.9
1956	14,061	5.9
1957	13,324	5.2
1958	12,070	(est) 9.4

The tools for case finding and diagnosis have undergone some changes in recent years but are still limited primarily to the x-ray, tuberculin test, and bacteriological examinations. It is generally recognized now that many other conditions can simulate tuberculosis on the x-ray, that tuberculin sensitivity and tuberculosis infections are not always synonymous, and that there are many strains of mycobacteria that look like tubercle bacilli under the microscope and can even cause a similar type of disease. But these developments have brought about better understanding as well as difficulties in interpretation.

The number of annual deaths has been decreasing rapidly in recent years (Table I). The year of greatest decline was 1953. The rates decreased from 15.8 in 1952 to 7.0 in 1958. The number of cases reported has been declining less regularly (Table II). The largest declines in both mortality and morbidity rates have taken place in the younger age ranges, as one would expect.

Basic to these trends are the changes taking place in the pattern of tuberculosis infection. Fortunately, too few infections have been taking place to maintain the disease, and a continuation of this deficit would lead eventually to its disappearance, but I hope we shall not wait years for this to take place.

Tuberculosis is no longer unpredictable. The relative rates of prevalence and incidence in major groups of the population are known. Furthermore, the risk is limited almost entirely to those now infected. Tuberculin test data, limited as they are, reveal that the rates of new infections are very low. In areas such as Minnesota, the rate is probably less than one new infection per thousand population per year. If low degrees of tuberculin sensitivity are discounted as insignificant, and this appears to be justified, the actual rates of infection are only about half those usually reported.

TABLE II. NEW ACTIVE CASES OF TUBERCULOSIS IN THE UNITED STATES

Year	Number	Per Cent Decline
1952	85,607	Activity not classified before 1952
1953	83,250	2.8
1954	78,592	5.6
1955	76,245	3.0
1956	68,866	9.7
1957	66,437	3.5
1958	63,336	4.7 (est)

From various tuberculin testing programs, it appears that there is a definite relationship between age and infection rates, and the curve for the population as a whole would look something like that in Figure 7. This is what one would expect from the case and death rates. But the risk of developing tuberculous disease, once infection has taken place, has quite a different relationship to age: high in infancy, low in the elementary school ages, and rising through the teen ages to a peak some place between ages twenty and thirty (Fig. 8). After age thirty, men appear to face more risk than women, but this may be due to a difference in infection rates.

Many other factors add to the risk. Previous active tuberculosis, contact with a tuberculous patient, diabetes, silicosis, weight below normal for height, alcoholism, low economic status, ethnic background other than white, limited education, size of tuberculin reaction, lack of family connections, any abnormality on the chest radiograph—all influence the probability of tuberculosis developing in the infected individual.

With the tuberculin test as the primary instrument, one should be able to sort out those who are

most likely to be the tuberculosis cases of the future and keep them under observation. Perhaps the new serum test will aid in further reducing the number to be watched. If prophylaxis through chemotherapy fulfills its promise, supervision could be cut short and new tuberculosis cases would become a rarity.

This would all be possible only as an extension of a good control program already in operation. I cannot emphasize too strongly the basic necessity for adequate individual supervision of known cases and the examination and follow-up of contacts. These are the groups with the highest risk. Some agency in the community must be doing this fundamental job in tuberculosis control if anything at all is to be accomplished. Beyond this, it should now be possible to extend the effort to gain a real strangle hold on tuberculosis.

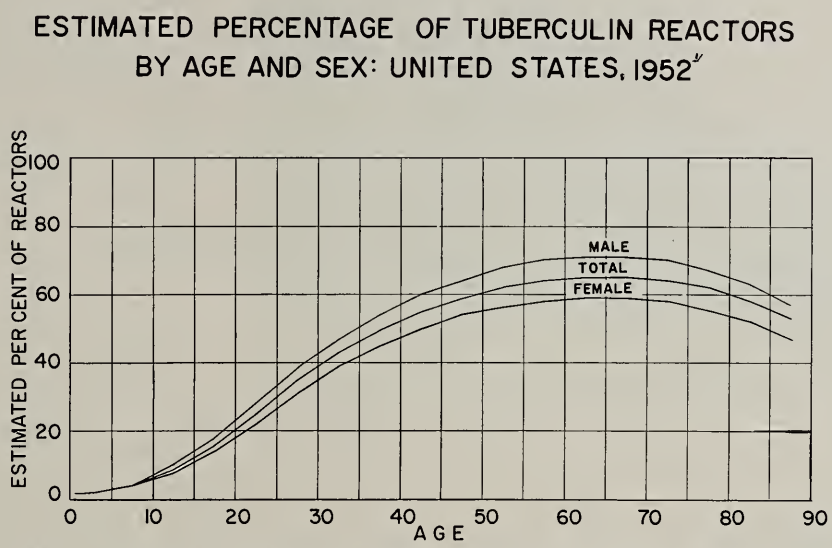


Fig. 7. Estimate of tuberculin reactors prepared by ETA in May, 1955, on basis of data from Florida, Michigan, Minnesota and Texas.

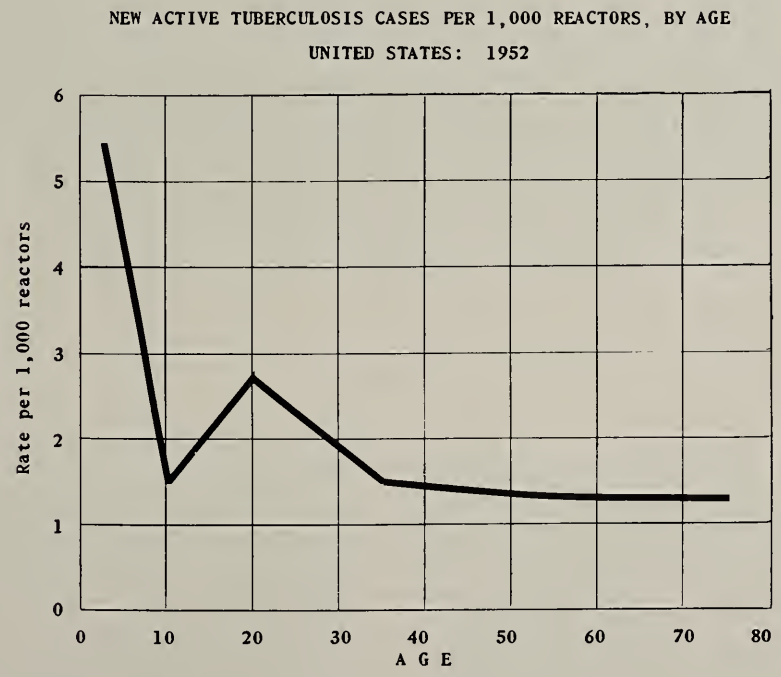


Fig. 8.

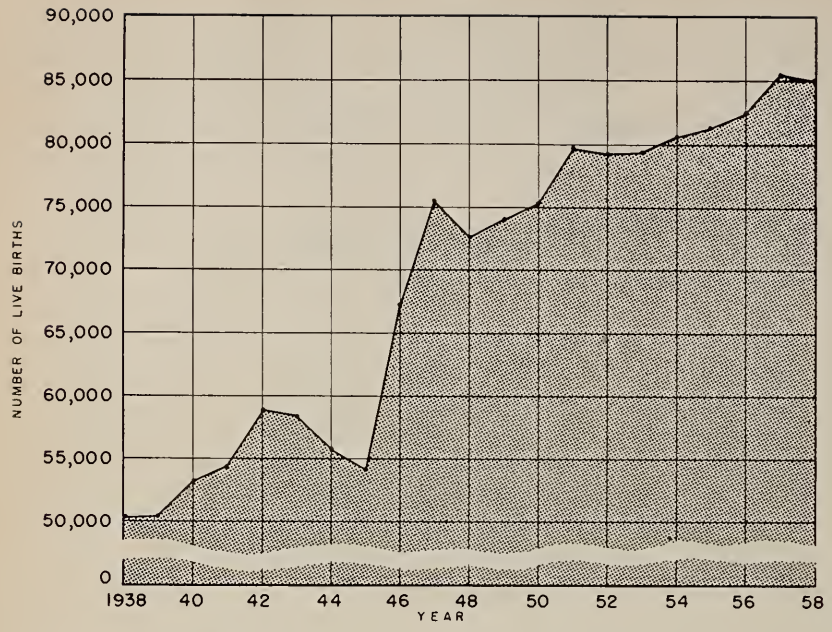


Fig. 1. Number of live births, by years, Minnesota, 1938-1958.

Public Health Aspects of the

● *Doctors concerned with the care of pregnant women and of newborns will do well to read carefully* The Public Health Aspects of the Prematurely Born Infant. *More babies are born in Minnesota every year; simultaneously, prematurity and immaturity are on the increase. The newest criteria of prematurity are reviewed. More than half of the perinatal deaths each year are in premies. Physicians concerned with saving more babies must direct many co-operative efforts towards the management of the problems of the premature.*

THERE has been a continuing increase in the number of live births in Minnesota during the past two decades; from 50,118 in 1938 to 84,924 in 1958, a 69 per cent increase (Fig. 1). This increase has occurred throughout the United States with a national total of more than four million live births annually for the past five years. A continuing increase is anticipated in the foreseeable future, for the next decade or two. By 1970, it is expected that there will be six million annual live births. Along with the increased number of births, the percentage of hospital deliveries has also increased; from 43 per cent in 1933 to 62 per cent in 1938, to 99.4 per cent in 1958. Thus, only a few hundred babies are born each year outside of Minnesota hospitals. Hence, the necessity for continuing interest in adequate hospital facilities and services. It is of interest to note that 99.9 per cent of all births in Minnesota are attended by physicians.

Accompanying the tremendous increase in the number of live births there has been a continuous decrease in the infant mortality rate. In 1915 it was 70 per 1,000 live births; in 1938 it was 38.8; and in 1958 it was 23.1. This is a reduction of 67 per cent since 1915 and of 40 per cent since 1938 (Fig. 2).

The low point, however, was reached in 1956

Prematurely Born Infant

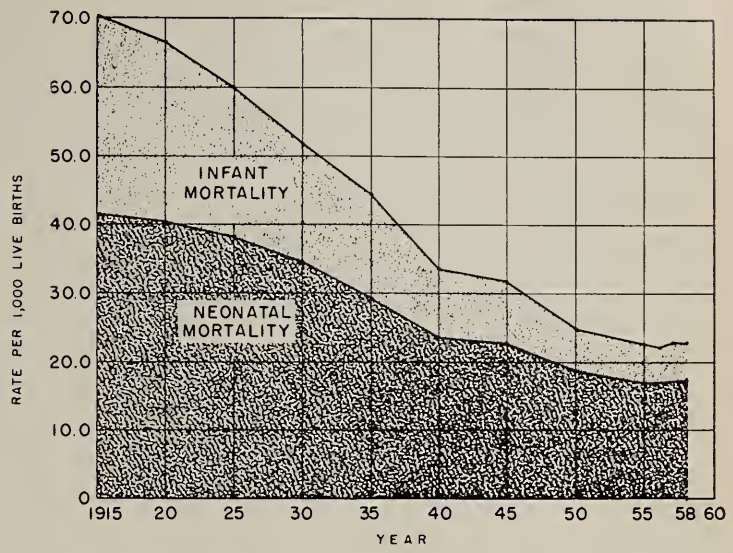


Fig. 2. Infant and neonatal mortality, Minnesota, 1915-1958.

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Presented at the Institute on Care of the Premature Infant for hospital and public health nurses, University of Minnesota Center for Continuation Study, November 30, 1959.

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with a rate of 21.9 per 1,000 live births. This was also the low point for the United States with a rate of 26.0. Thus, there was a slight increase in 1957 and 1958 in Minnesota as well as nationally. This is the first increase in the infant mortality rate in the United States in two decades and there is, therefore, considerable concern as to the cause of the increase as well as to the possibility of a continued rise in mortality. In Minnesota the rise in the mortality rate has been due almost entirely to an increased mortality from communicable diseases, and specifically from pneumonia of staphylococcal and viral infection.

The neonatal death rate (death of infants less than 28 days old) has also decreased, from 41.2 per 1,000 live births in 1915 to 26.2 in 1938, and to 17.5 in 1958. This is a reduction of 57.5 per cent since 1915 and of 33 per cent in the past two decades (Fig. 2); but the percentage of decrease has not been as great as that of infant mortality. In other words, we have been more successful in reducing deaths during the postnatal period (between one and twelve months of age) than during the first month of life. Therefore, if we are to further reduce infant deaths we must succeed in reducing the causes of death in the neonatal period, and particularly during the first few days after birth. Hence, our special interest

in this period of life. This is the reason for the current perinatal mortality study in Hennepin county, at Duluth and other areas in the state, and most recently in St. Paul and Ramsey county where such a study is now being developed.[2,3]

Prematurity (or immaturity) is a major factor in fetal deaths (stillbirths) and in deaths among babies during the neonatal period. More than half of the 138,000 annual deaths in the U. S. which occur in the perinatal period, extending from the twentieth week of pregnancy through the first week after birth, are among premature infants (those weighing 2,500 gm. [5½ lb.] or less at birth).[4,5] While this definition of prematurity of the World Health Organization has been approved by the U. S. Public Health Service and Children's Bureau, American Academy of Pediatrics, State Health Departments, The Association of State Maternal and Child Health Directors, the American Public Health Association, and other agencies it should be pointed out that it is not entirely satisfactory. A brief consideration of the many criteria proposed for the diagnosis of prematurity and their associated problems is of interest.

Prematurity is the termination of pregnancy in the period from the beginning of the twenty-eighth week to the thirty-seventh week of gestation. The usual estimate of a full-term pregnancy is 280 days (ten lunar months or forty weeks). While this estimate is used quite freely as a standard, it should be kept in mind that there are great variations, from 220 to 330 days, with an average of 270 days. Even if the exact date of conception is known, which is seldom, the calculated date may be off one to two weeks, early or late. The diagnosis of prematurity based on clinical signs depends on the training, experience, and clinical judgment of the physician. It varies from one physician to another and from time to time by the same physician. It is therefore neither objective nor standard.

Since a definition of prematurity based on calculation of the gestation period is not satisfactory, certain objective criteria have been adopted.[6] Such criteria as birth weight, crown-heel length, head and chest measurements, and the degree of development of certain centers of ossification are more objective than are clinical signs. Alone or in combination with one another or with gestational age, the criteria that indicate (or at least suggest) prematurity are:

1. Birth weight of 2500 grams (5½ lb.) or less
2. Crown-heel length of 47 cm. (18½ in.) or less
3. Occipito-frontal diameter of head 11.5 cm. (4½ in.) or less
4. Head circumference of less than 33 cm. (13 in.)

TABLE I.
TOTAL LIVE BIRTHS, FULL-TERM AND PREMATURE
(Minnesota, 1958)

Live Births	Number	Per Cent
Full-term	79,948	94.14
Premature	4,976	5.86
2001-2500 gm.	3,209(64.5%)	
1501-2000	973(19.5%)	
1001-1501	408(8.2%)	
Under 1000	386(7.8%)	
Total	84,924	100.00

5. Thorax circumference of less than 30 cm. (11¾ in.)
6. Disproportion between head and thorax of more than 3 cm.
7. X-ray evidence of development of centers of ossification

There are however, certain problems encountered in using these criteria. It is difficult to measure accurately a tiny squirming infant, and length varies greatly with weight. Other measurements are time-consuming. X-ray of ossification centers (usually the proximal tibial epiphysis) requires special techniques and trained personnel, is not readily available in the out-state areas, and is accurate only within wide limits. The single criterion of prematurity that has been most generally used is a birth weight of 2,500 gm. (5½ lb.) or less. The weight is easily obtained and, although not an exact indicator of prematurity, has provided a satisfactory criterion of the need for special care, as well as a uniform basis for statistical analysis. Some advocate the use of two of the three criteria of weight, length, and gestation.

The incidence of prematurity varies from 6 to 16 per cent. In the United States the incidence of premature birth is approximately 7 per cent of all live births in population groups of reasonably favorable socio-economic circumstances.[4] In Minnesota, the rate is 5.9 per cent (Table I). The incidence is higher than average among younger women (fifteen to nineteen years), among primiparas, and in women having their first child past age forty. The rate is higher for negro infants, in multiple births, and in women with a history of previous fetal loss. Lack of prenatal care, unfavorable socio-economic conditions, ma-

ternal dietary deficiencies, and certain obstetrical complications such as toxemia and abruptio placenta are also associated with a high rate of prematurity. However, the majority of premature births are not satisfactorily explained.

TABLE II. OBSTETRIC COMPLICATIONS BY INFANTS' BIRTH WEIGHT
Hennepin County Perinatal Mortality Study
(1710 Neonatal Deaths 1952-1956)

Complication	Weight of Infant in Grams					Premature Total	Full-Term	Total
	1000 & Under	1001-1499	1500-1999	2000-2500	2500 & Over			
Antenatal bleeding	99	35	19	16	14	183	15	198
Abruptio placenta	44	31	23	14	23	135	14	149
Placenta previa	14	18	13	9	12	66	5	71
Toxemia of pregnancy	12	10	10	7	13	52	26	78
Infection	21	6	9	4	10	50	19	69
Polyhydramnios	8	1	6	8	6	29	14	43
Pelvic inadequacy	0	1	2	9	0	12	9	21
Prolapsed cord	7	1	5	3	1	17	9	26
Abnormality placenta or cord	8	9	3	1	0	21	3	24
Diabetes mellitus	3	0	3	0	1	7	13	20
Other	19	4	8	5	6	42	6	48
Total	235	116	101	76	86	614	133	747

TABLE III. MATERNAL FACTORS IN 255 FETAL DEATHS BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1955

Maternal Factor	Weight of Infant in Grams					Total
	1000 & Less	1001-1500	1501-2000	2001-2500	Over 2500	
Previous premature birth	7	7	5	6	9	34
Previous abortion	11	6	8	11	22	58
Abruptio placenta	14	8	10	10	20	62
Placenta previa	4	0	0	0	0	4
Antenatal bleeding, cause unknown	20	5	3	3	4	35
Toxemia	4	7	3	5	10	29
Maternal diabetes	2	0	1	2	5	10
Prolapsed cord	4	0	2	3	0	9
Inadequate pelvis	0	0	0	0	1	1
Total	66	33	32	40	71	242

The five-year summary of the Hennepin County Perinatal Mortality Study for 1952-56[2] shows that obstetric complications were encountered in 747 of the 1710 infants in the study, or 44 per cent of the neonatal deaths (Table II). Thus, in more than half of the pregnancies there were no known obstetrical or maternal abnormalities; 614 out of the 747 complications occurred in premature births, mostly abruptio placenta, placenta previa, undiagnosed types of antenatal bleeding, and toxemia.

Fetal deaths are also associated with maternal factors. Of 255 fetal deaths studied by the committee in 1955, maternal factors were found in 242 with 70 per cent occurring in premature births (Table III). A history of previous premature birth or previous abortion occurred in 36 per cent of the premature fetal deaths. Obstetric complications were mostly toxemia, abruptio placenta, antenatal bleeding of unknown cause, and prolapsed cord. One-half of the stillbirths of premature weight was ascribed to placental and cord conditions and one sixth to the maternal conditions of toxemia, and diabetes. State-wide, fetal death certificates for 1958 ascribe 39 per cent of all fetal deaths to placental and cord conditions.

Premature birth takes a higher toll of infant life than any other condition and it is one of the ten leading causes of death among the general population in the United States as well as in Minnesota. While only about 6 per cent of Minnesota births are premature, the mortality rate among these babies is so high that deaths assigned to premature birth (unqualified) accounted for almost one-fourth (22.2 per cent) of all deaths during the first year of life in 1958 (Table IV). Many of the infants whose cause of death was reported as due to "premature birth" were doubtless too immature for survival. Others, mature enough to survive, may have died from some undiagnosed condition. In addition, birth injuries and congenital malformations are not infrequently the cause of death of premature infants but are

TABLE IV. LEADING CAUSES OF INFANT MORTALITY
(Minnesota, 1958)

Causes of Death	Number	Per Cent
Premature birth	434	22.2
Postnatal asphyxia and atelectasis	296	15.2
Other conditions of early life	189	9.7
Injury at birth	230	11.8
Congenital malformations	334	17.0
Communicable diseases	271	14.0
Other	199	10.1
All causes	1953	100.00

tabulated under these specific causes of death, rather than immaturity, unqualified.

The marked reduction in infant mortality during the past two decades is presented in Figure 3. There was a 40.5 per cent reduction in the total infant mortality from 1938 to 1958. For specific causes there was a 40 per cent decrease in deaths due to immaturity and atelectasis combined, a 31 per cent reduction in birth injuries, 27 per cent reduction in deaths due to congenital malformations, and a tremendous reduction of 62 per cent in deaths due to communicable diseases.

There were 1,953 infant deaths in 1958. Of these, 1,489 occurred during the first twenty-eight days of life. Thus, three-fourths (76 per cent) died within the so-called neonatal period. During the neonatal period, prematurity unqualified was responsible for more than one-fourth (28.6 per cent) of the deaths (Fig. 4). Postnatal asphyxia and atelectasis accounted for an additional 20 per cent. Congenital malformations and birth injuries each accounted for 15 per cent of the deaths. Erythroblastosis and communicable

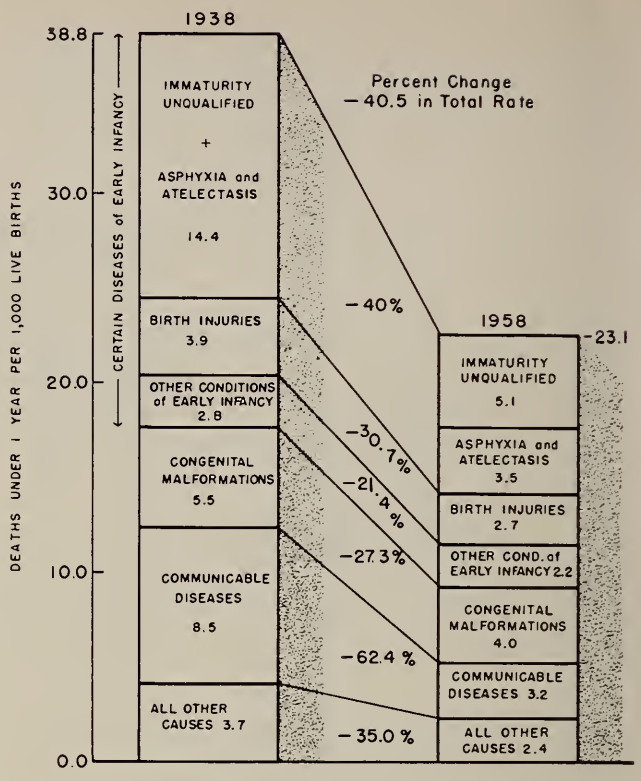


Fig. 3. Main causes of infant mortality by rates, Minnesota, 1938 and 1958.

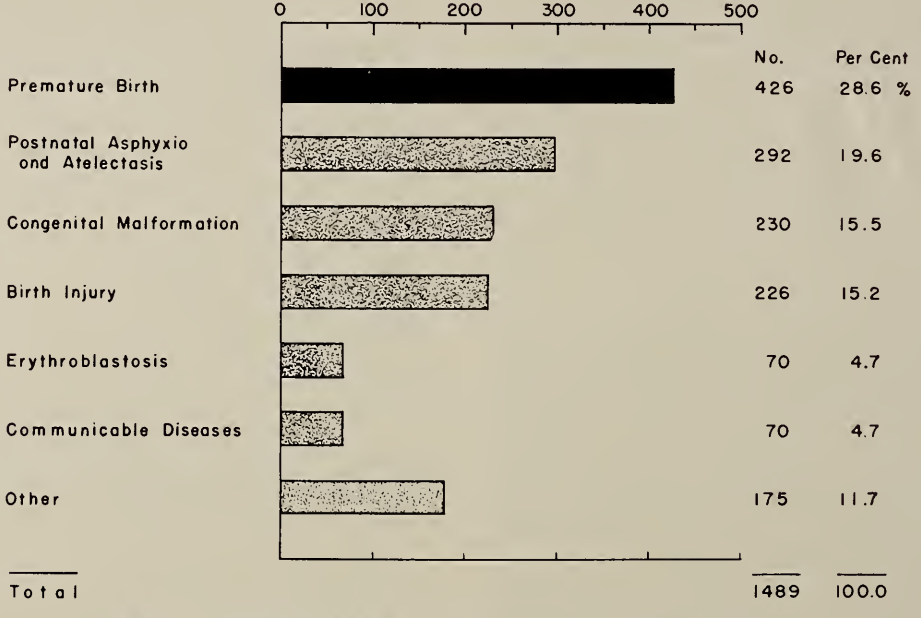


Fig. 4. Neonatal deaths by specific causes, Minnesota, 1958.

diseases each were responsible for slightly less than 5 per cent of the neonatal deaths. It is therefore important to consider this critical period of life.

In a large proportion of the deaths of premature infants, no cause other than prematurity can be determined. It is often difficult, if not impossible, to determine the cause of death of these infants, even in some cases where autopsy was performed. While the post-mortem diagnosis of the cause of death is more exact than a clinical diagnosis, it is dependent on the expertness of the pathologist and the correlation of the findings with the medical history and physical examination of the infant.

The five-year summary of the causes of death of 1,710 neonatal deaths in the Hennepin County study (Table V) shows that there were 1,239 premature infants, comprising 72.5 per cent of the neonatal deaths, with an autopsy rate of 59.6 per cent, and 471 full-term infants with autopsy rate of 86 per cent. The causes of death are the same in two groups; only the percentages are different. Abnormal pulmonary ventilation (Dr. Edith Potter's term)[7] which includes immaturity unqualified and means immature lung tissue, atelectasis, and hyaline-like membrane disease accounted for more than three-fourths of the premature infants, but for only 28 per cent of the full-term infants. Congenital anomalies were the leading cause of neonatal death in the full-term infants, one-third of the deaths (33.5 per cent), but accounted for only 8 per cent of the premature deaths. Blood dyscrasias caused 12 per cent of the full-term deaths and was the third leading cause of death, but caused less than 2 per cent of premature deaths. Birth trauma caused 7 per cent of the full-term deaths and less than 4 per cent of the premature deaths.

TABLE V. CAUSES OF 1,710 NEONATAL DEATHS
Hennepin County Perinatal Mortality Study, 1952-1956

Cause of Death	Premature (2500 gm. or less)		Full-Term (2501 gm. and over)		Total	Per Cent
	Number	Per Cent	Number	Per Cent		
Abnormal pulmonary ventilation	991	80.0	133	28.3	1124	65.7
Congenital anomalies	97	7.8	158	33.5	255	14.9
Infection	39	3.1	43	9.1	82	4.8
Birth trauma	43	3.5	33	7.0	76	4.4
Blood dyscrasia	20	1.6	58	12.3	78	4.6
Anoxia	25	2.0	21	4.5	46	2.7
Other	24	2.0	25	5.3	49	2.9
Total	1239 (72.5%)	100.0	471 (27.5%)	100.0	1710	100.0

TABLE VI. TYPES OF DELIVERY BY PREMATURE AND FULL-TERM WEIGHT
Hennepin County Perinatal Mortality Study, 1952-1956

Type of Delivery	Premature (2500 gm. or less)		Full-Term (2501 gm. and over)		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Cephalic	739	59.7	366	77.7	1105	64.6
Breech	333	26.9	43	9.1	376	22.0
Cesarean section	113	9.1	44	9.3	157	9.2
Version and extension	35	2.8	10	2.1	45	2.6
Unknown	19	1.5	8	1.7	27	1.6
Total	1239	100.0	471	99.9	1710	100.0

TABLE VII. NEONATAL SURVIVAL AND MORTALITY BY BIRTH WEIGHT
(Minnesota, 1958)

		Survival Rate	Neonatal Mortality
Full term		99.34%	0.66%
Premature		81.1	18.9
2001-2500 gm.	95.6	4.4	
1501-2000	77.5	22.5	
1001-1500	45.1	54.9	
1000 and less	8.1	91.9	

Complications of delivery also play a part in premature neonatal deaths. The Hennepin County study of the types of delivery from 1952-1956 shows that in 60 per cent of the neonatal deaths among prematures, the infants presented cephalically; in 27 per cent they were breech deliveries, and 9 per cent were cesarean sections. Among full-term neonatal deaths 78 per cent were cephalic, 9 per cent were breech deliveries, and 9 per cent were sections (Table VI). Less than 5 per cent of all live births are breech deliveries and the cesarean section rate in Minnesota is between 5 and 6 per cent. The smaller the infant, the more likely it is to be delivered as a breech. In this study, breech deliveries occurred in 33 per cent of the prematures of 1,000 gm. or less; in 15 per cent of those between 2001 and 2500 gm. Breech delivery and cesarean section are particularly hazardous to the premature infant.

Now, let us consider the significance of actual birth weight in survival or death, as well as the time of death during the neonatal period. While

less than 1 per cent of full-term infants died during the first twenty-eight days of life (0.66 per cent to be exact), 19 per cent of all premature infants died during this same period (Table VII). The chances of a full-term infant surviving the neonatal period were thus twenty-eight times greater than that of the prematurely-born infant.

There is, however, a marked difference in survival rate depending on the birth weight of the premature. The prognosis is excellent in infants weighing 2001-2500 gms. (4 lb. 7 oz to 5 lb. 8 oz.), with only 4.4 per cent dying during the first month. The prognosis gets worse with decrease in weight. In infants between 1501-2000 gms. (3 lb. 5 oz. to 4 lb. 6 oz.) the mortality is 22.5 per cent; between 1001-1500 gms. (2 lb. 4 oz. to 3 lb. 4 oz.) 55 per cent died. Infants weighing 1000 gms. or less (2 lb. 3 oz. or less) had only an 8 per cent chance of survival, 91.9 per cent died.

The Hennepin County Perinatal Mortality Study has provided data on the age of death of prematures. The five-year summary in Table VIII gives the duration of life by birth weight. The first twenty-four hours were the most critical period of life, with two-thirds of the premature deaths in this period. One-sixth (15.6 per cent) occurred in the second twenty-four hours after birth, 12.6 per cent between two and seven days, and 5 per cent from one week to under one month. Eighty-two per cent of all prematures who died in the neonatal period actually died during the first forty-eight hours; only 62 per cent of the full-term infants died during this period.

In summary, infancy is a most serious period of life. Of those who die during the first year of life, three-fourths actually die during the first month of life, the so-called neonatal period. In the neonatal period, the chief cause of death is prematurity. Of all the premature infants who die during this critical period, two-thirds die during the first twenty-four hours and more than 80 per cent die within the first forty-eight hours after birth. We must, therefore, be particularly concerned with the prematurely-born infant and the first forty-eight hours of life.

The problem of reducing prematurity and its resulting high fetal and infant loss is quite complex. Early and adequate prenatal care with improvement of maternal dietary habits is essential. The importance of preconceptional care has, so far, received little attention. Better medical and obstetric management during pregnancy and skilled pediatric and nursing care during the early neonatal period, as well as adequate later care are of primary importance. Dr. Ethel Dunham,[6] who has written extensively on the subject, has summarized the situation as follows:

TABLE VIII. DURATION OF LIFE BY BIRTH WEIGHT
Hennepin County Perinatal Mortality Study, 1952-1956
(1710 Neonatal Deaths)

Duration of Life	Premature (2500 gm. or less)		Full-Term (2501 gm. or over)	
	Number	Per Cent	Number	Per Cent
Under 1 hour	175	14.1	62	13.1
1-24 hours	652	52.6	151	32.1
24-48 hours	193	15.6	81	17.2
2-7 days	156	12.6	103	21.9
8-28 days	63	5.1	74	15.7
Total	1239	100.0	471	100.0

> Saving these infants necessitates increasing efforts to prevent premature birth; getting more detailed information on deaths assigned to premature birth alone; spreading knowledge of and facilities for the special care to be needed by premature infants; and broadening through research the scope of knowledge in regard to the problems of prematurity.

Progress has been made during the past several decades as has been described; but there is still much more to be done. This requires the cooperative efforts of all concerned.

References

1. Minnesota Department of Health: Periodic vital statistics reports, 1915-1958. (Various formats)
2. Rosenfield, A. B.: The Hennepin County perinatal mortality study. Minnesota Med., 42:240-247 (March) 1959.
3. Hennepin County Perinatal Mortality Committee: Three-year study of neonatal deaths in Hennepin County. Minnesota Med., 40:710-717 (Oct.) 1957.
4. Hunt, Eleanor P., and Moore, Ruth, R.: Perinatal, Infant, Childhood and Maternal Mortality, 1955. 36 pp. (Children's Bureau Statistical Series No. 50) Washington, D. C.: U. S. Children's Bureau, 1958.
5. U. S. Public Health Service: National Office of Vital Statistics: Fetal deaths: United States and each state, and Alaska, Hawaii, Puerto Rico, and the Virgin Islands (U. S.), 1956. Vital Statistics-Special Reports, 13:361-384 (Oct. 7) 1958.
6. Dunham, Ethel C.: Premature Infants. 2d ed., rev. 459 pp. New York: Harper, 1955.
7. Potter, Edith L.: Pathology of the Fetus and the Newborn. 574 pp. Chicago: Year Book Publishers, 1952.

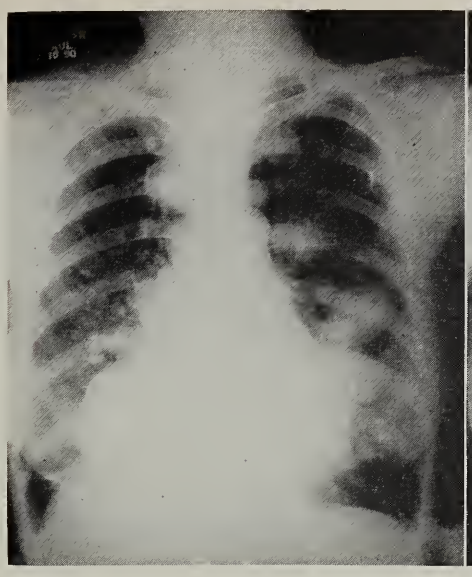


Fig. 1. Radiograph taken on March 16, 1950, showing multiple variable sized roundish lesions in both lung fields.

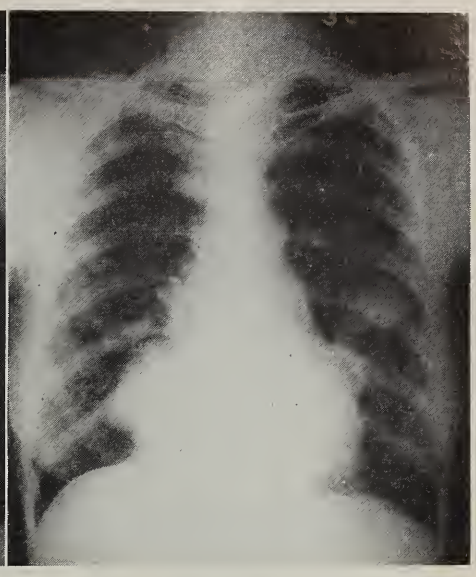


Fig. 2. First chest radiograph taken on November 24, 1957, by the Public Health Survey, showing fewer and smaller lung nodules than on the 1950 radiograph.

Metastatic Hypernephroma of Fifty Years' Duration

● *An interesting report of a patient living fifty years with a hypernephroma and metastases.*

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D. R. GILLESPIE, M.D.
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From the Earl Clinic, Saint Paul, Minnesota.

THE FOLLOWING case report is presented to demonstrate the low grade nature of the malignancy in this case and the need for serial x-ray studies of the rate of tumor growth before giving a prognosis.

This patient, a woman aged seventy-four years, was first seen in March, 1950, for discomfort in the chest. At this time, she complained of fatigue, tightness in the chest, and a cough which had been present for six months.

Upon physical examination numerous rales were heard throughout both lungs. Laboratory examinations showed a hemoglobin of 11 gms. and a blood sedimentation rate of 110 mm/hr. (Westergren). The remainder of the examination was not significant.

A chest radiograph at that time showed multiple, variable-sized roundish lesions in both lung fields, which were thought to be metastatic lesions (Fig. 1). Origin

of the primary tumor was indeterminate at that time. X-rays of the gastrointestinal tract, lumbar spine and pelvis were negative except for the absence of the left kidney. The right kidney was of normal size. Re-examination of the pelvis and breasts were negative.

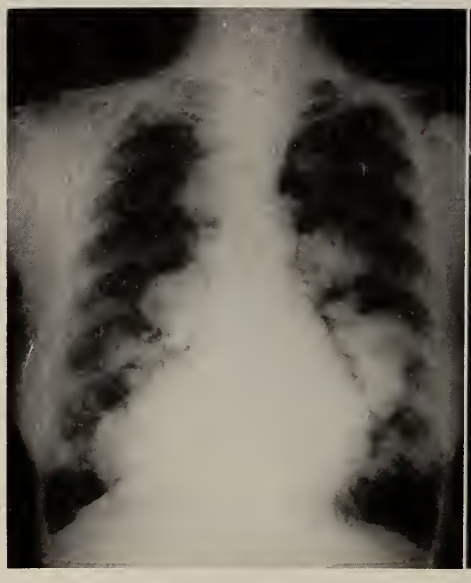


Fig. 3. Radiograph taken on May 19, 1953, showing increase in size and number of lesions.

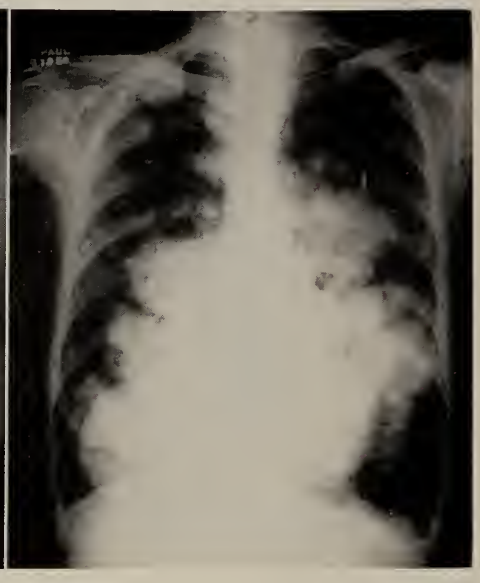


Fig. 4. Chest radiograph taken on September 19, 1956, showing marked increase in size and number of lesions.

The past history of the patient was reviewed. She stated that about 1907, at the age of thirty-one, two years after the birth of her only son, she had noted a mass in her left abdomen and had consulted a doctor who advised its removal. The patient declined surgery at that time. Over the years, the mass gradually increased in size until in 1917, at the age of forty-one, its size caused her enough distress that she agreed to its removal. The surgery was performed at Ancker Hospital by John L. Rothrock, M.D., but no records or specimen are available. After surgery, he told the patient that it was a malignant tumor of the left kidney, necessitating the removal of the tumor and kidney. Following the surgery and until seen in 1950, she had had no medical care. She mentioned, however, that three years previous to this time, she did have chest radiographs at the Public Health Center during the period when radiographs were being taken to uncover cases of tuberculosis. The Public Health Center was consulted and radiographs taken on November 24, 1947, were obtained. This chest radiograph showed the presence of the same metastatic nodules but they were fewer in number and of smaller size than those evident on our recent chest x-ray (Fig. 2). In view of this slow growth, it seemed probable that the tumor of the kidney removed in 1917 represented the primary source of the metastatic lesions.

The patient was seen at frequent intervals from 1950 until March, 1957, at which time she was admitted to Ancker Hospital for terminal care. During this seven-year period, she had frequent attacks of pneumonia with severe dyspnea. She responded very well to antibiotic therapy for the first four years, but during the last three years her vital capacity became so poor that her exercise tolerance progressively decreased and she would become cyanotic on the least exertion. She was maintained on almost continuous antibiotic therapy during the last year. In 1954, a mass had been noted in the epigastrium and had gradually increased in size. She maintained her weight very well until the last two years when there was a progressive loss of strength and weight from 154 pounds in 1954, to 112 pounds in 1956. She also complained of increasing indigestion.

Radiographs of the chest were taken yearly in order to follow the progress of the metastatic tumors. Figures 3 and 4 represent radiographs taken in 1953 and 1956.

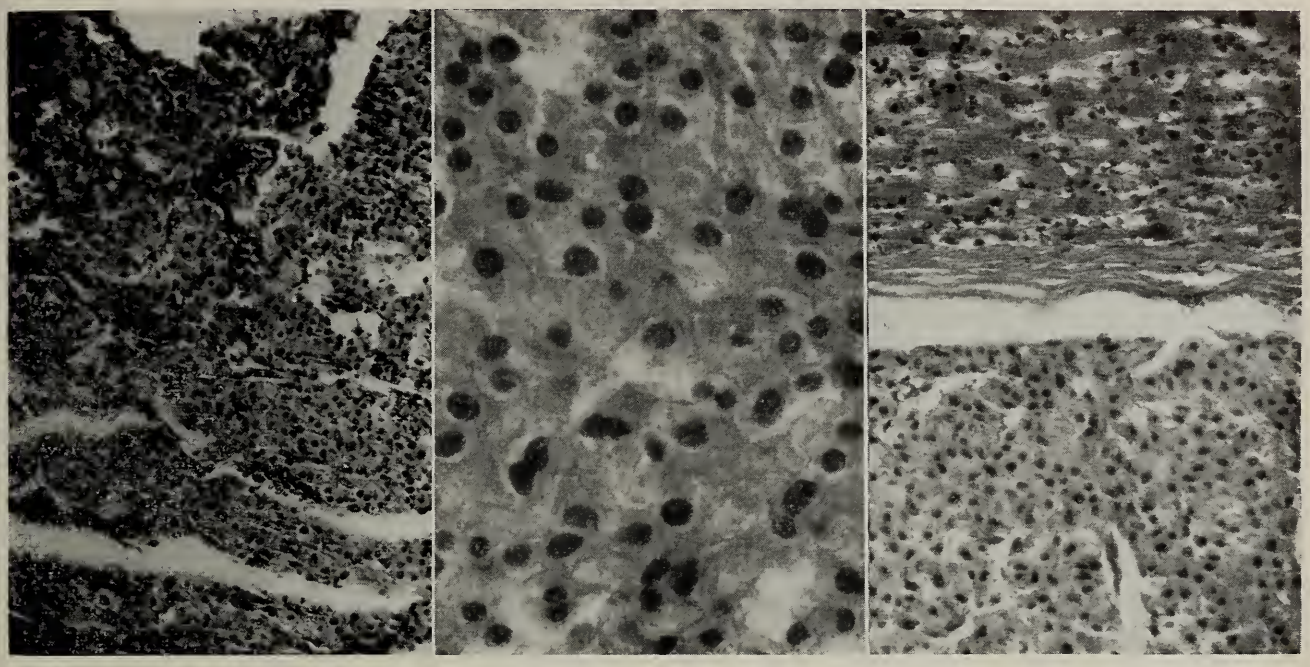
It was particularly of interest that although most of the nodules had increased in size, some of them had actually decreased in size during this period of observation.

On March 13, 1957, she was transferred from a nursing home to Ancker Hospital for terminal care. The patient was extremely dyspneic and was in an oxygen tent for intervals during her hospital stay. She gradually continued her slow terminal course and died on August 14, 1957. An autopsy was performed by John Noble, M.D., pathologist at Ancker Hospital, who has made available to us the reports and slides for this report.

Autopsy examination, performed on August 14, 1957, was non-contributory except for the following findings related to the metastatic malignancy: Upon physical inspection there was a left paramedian scar, measuring 13.0 cm. in length, extending from just above the umbilicus to the symphysis.

Thorax.—The right lung was bound down with apical adhesions. The right pleural cavity contained approximately 100 cc. of a serosanguineous fluid. The pleural

surface was studded with elevated, pinkish-grey nodules, the largest measuring about 3.0 cm. in diameter. The left lung was bound down by apical adhesions. The tissue, probably representing the renal pedicle. On cut section through this, no gross evidence of tumor was seen.



Figs. 5, 6, 7. Photomicrographs of metastatic tumor of the lung.

left pleural cavity contained approximately 100 cc. of serous fluid. The left pleural surface was studded with tumor nodules similar to those seen on the right lung.

Lungs.—The right lung weighed 1,401 grams. The surface of the right lung showed fibrous adhesions in the right apex. The surface was grossly nodular. On cut section, the lung was filled with tumor nodules which measured up to 9.0 cm. in diameter. The tumor was yellowish and white in color. Areas of tumor necrosis were seen. The left lung weighed 1,336 grams. It showed a picture entirely similar to that of the opposite organ. The nodules in the parenchyma of each lung were cauliflower in appearance on cut section.

Liver.—The liver weighed 2,338 grams. The surface of the liver showed elevated nodules and the edges were somewhat rounded. On cut section, there was an 18.0 cm. tumor mass in the right lobe of the liver. This tumor was cauliflower in appearance and it was yellowish-white and necrotic in the center. The remainder of the liver parenchyma was not remarkable.

Kidneys.—The right kidney weighed 217 grams. Its capsule was opaque and quite thickened. The capsule stripped with ease, leaving a smooth surface on cut section; the cortex and medulla appeared larger than normal. The pelvis and ureter were normal. The left kidney was represented by a nub of fat and connective

Microscopic examination of the lungs showed large areas which were replaced by a metastatic growth in large lobulated areas. In some places, the tumor was necrotic. Where it was well preserved, it was composed of sheets and cords of rather large cells with abundant light staining cytoplasm. There was considerable variation of nuclear size and shape. A few abnormal mitotic figures were seen (Figs. 5 and 6).

Sections through the liver showed that the liver was replaced and compressed by tumor similar to the metastatic hypernephroma seen in the lung (Fig. 7).

Final Diagnosis.—Hypernephroma of the left kidney, resected, with metastases to lungs and liver.

Summary

This is a case of hypernephroma of the left kidney, first noted in 1907, when the patient was thirty-one years of age. She was operated on ten years later, at the age of forty-one years, because of the size of the tumor. There were no symptoms of hematuria or urinary tract infection, either before or following surgery. In 1947, the first evidence of metastatic lesions in the chest was found. Serial radiographs taken during the last ten years are presented. The patient died at the age of eighty-one years, or fifty years after first noting a tumor in her left abdomen.

Journalism in

ARTHUR H. WELLS, M.D.

Editor-in-Chief of MINNESOTA MEDICINE and Pathologist at St. Luke's Hospital, Duluth, Minnesota.

Presented at the Annual Meeting of American Medical Writers' Association, October 2, 1959, St. Louis, Missouri.

Yesterday's MINNESOTA MEDICINE and the buggy have much in common. Today the journal is a crumpled, crayon-smeared sheet in the hands of children. Tomorrow's publication will come when good judgment and a pioneering spirit demand and the Jehovah complex permits.

OUR president, dean of American medical editors, leader and servant, Morris Fishbein, has requested a twenty-minute review of the recent changes in MINNESOTA MEDICINE and the experiences which brought them about. These changes and experiences will be covered as they relate to typography, procurement, editing and financing in our state medical journal and will be followed by a brief listing of suggestions for the future promotion and control of all forms of medical communications within the state.

Current Trends

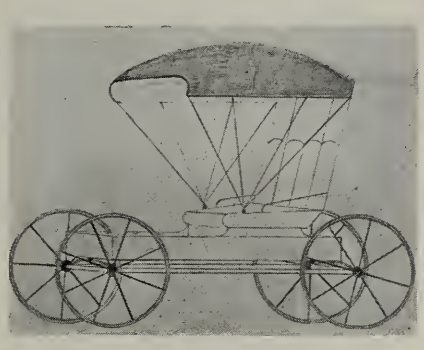
Medical editors have watched with enthusiasm the renaissance which has been taking place among the medical journals of our country during the past five years, a trend initiated in large part by the educational programs promoted by the American Medical Writer's Association and by the State Journal Advertising Bureau. This application of advancing knowledge in the science of semantics has seen vigorous usage in the more highly competive and sophisticated national lay magazines for many years. Within the decade, a warning bell was sounded when a national magazine with a century of experience and with a large circulation failed because of its inability to see and to recognize the importance of the trend. It maintained a rigid policy of strict conservatism in visual style. May we conclude that in journalism, as well as in medicine, that which has been highly successful in the past need not be acceptable in the future?

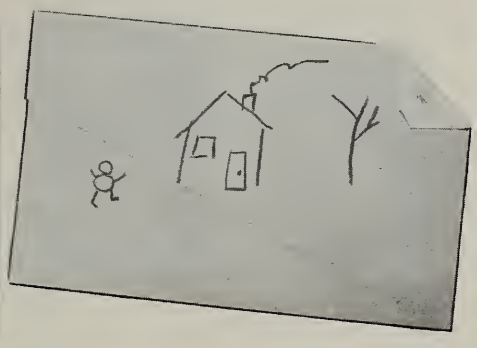
In the last few years we have seen new national medical journals *(Postgraduate Medicine* and *GP)* launched and soaring to leadership in the field. They have made bold and successful efforts to crack the sound-barrier of satisfaction with the *status quo*. They have utilized all the advantages of psychology in modern journalism to attract and hold the minds of men. If busy physicians are reading these glamorous, yet scientifically informative publications, will the older, well-established and more reserved periodicals receive the same attention they did in the past?

Typography

Ten physicians representing the newly-formed and personally-selected Board of Editors of MINNESOTA MEDICINE, armed with a loose-leaf binder to record their experiences and a style manual on medical writing, began six years ago to grope their way through the maze of knowledge known as journalism. Ambushed, beseiged and hobbled by a traditionally long-standing Editing and Publishing Committee; by a Council which has always considered MINNESOTA MEDICINE faultless and the leader of state medical journals, and by the journalistic inexperience of all the physicians involved, it is a wonder that this board of voluntary amateurs ever survived.

From the outset it was apparent that the most intriguing, and possibly the most rewarding field of activity for the committee concerned typography or the visual aspects of printing and their psychologic effects. We learned that this general subject of style might be divided into at least eight different areas for consideration: format, cover, table of contents, headings, body type and column treatment, illustrations, lay-outs, paper, ink, press-work and engravings. We also learned, following a critical survey of the journals of the S.J.A.B. by







O. M. Forkert and Associates of Chicago, that we rated poor in style in most areas of usage and below the average of other state medical journals. Five years later the same group of consultants for journalists and advertisers found MINNESOTA MEDICINE ranking in typography among the three best of the state medical journals. The scientific content of these journals was not a consideration. The difficulties experienced by the Board of Editors in bringing about this moderate change, using standards generally accepted by journalists is a part of this presentation. The efforts of the Board during its first year were characterized by repeated frustrations concering suggested alterations in the printing of our Journal. We finally realized that our printing company, long-established, deservedly successful, with multiple facets of interest and a heavy burden of varied responsibilities, had lost perspective. After several varied approaches to the problem, it became obvious that this would be a chronic ailment and best cared for, in this instance, by simply pushing the patient around and I don't mean in a wheel chair.

Cover

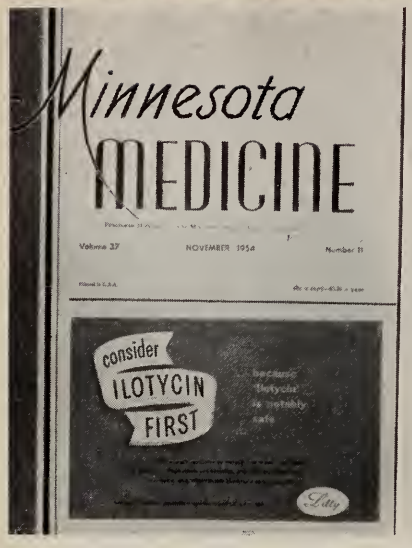
A recent cover of our publication (Fig. 1) should have been given a journalistic citation of some kind since it displayed at least fifteen styles of type with each issue. It proudly indicated its national origin. In some issues, postal inspectors could see at a glance that it was within the law. The price per single issue was clearly displayed perhaps to prevent cheating at news stands. The principal and inexcusable feature was that the cover undersold the publication to its prospective readers and advertisers by displaying a dominating advertisement.

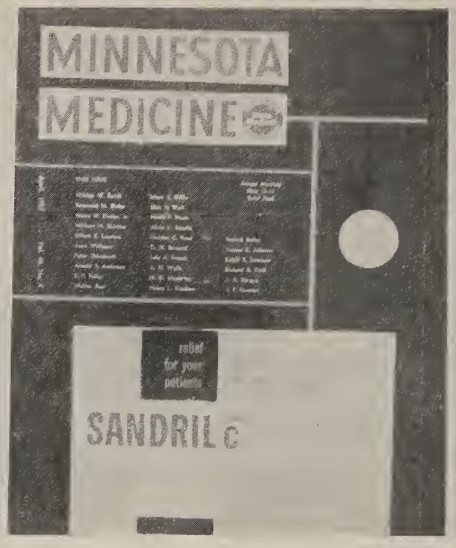
The Board of Editors was eventually permitted to partially change this monstrosity if there were no additional cost. The first new cover (Fig. 2) contained the essentials for identification, a listing of authors, and a guide to the contents page. To eliminate the advertisement of a pharmaceutical house from the cover, it was finally necessary to convince Mr. O. M. Forkert that it was his duty to talk at a combined meeting of the Council, the Editing and Publishing Committee, and the Board of Editors in Minneapolis. The cover which resulted from this meeting (Fig. 3) has the essentials for identification plus what we hope is a dignified "sales pitch" for the contents. Some may see a "pitch" for future manuscripts in the unconventional listing of authors in an "honor plaque." To me, these authors of scientific content are the making of the journal, and they should be given at least this recognition.

A needed future improvement in the cover of our Journal is an ever-changing, skillfully-staged, appropriate art work in multiple colors, related to occasion or content, having a motivating intensity approaching persuasion (see *The Journal of the Michigan State Medical Society).*

Contents Page

According to our Readers' Interest Survey (described later) the Contents Page was the most important single part of our journal. To this end, we changed from one page (Fig. 4) to a coverage by two facing pages (Fig. 5). This was also permitted by the Council provided that there was no







additional cost or loss of advertisements. After gentle, persuasive, forceful and belligerent contacts, this was accomplished first by combining contents with other essentials on two opposing pages. Later, an advertiser's demand for space opposite a listing of the officers of the society permitted a separate posting of instructions to authors, subscribers, postmaster, et cetera. Thus a third change in the table of contents (Fig. 6) provided for a sub-division and listing of editorial matter in some detail, not yet complete but improved. The prominent space devoted to "The Advertising Pays for Your Journal" and the old gimmick of listing the Minnesota medical societies affiliated with the journal is for the benefit of both advertisers and physicians. We are not opposed to money or apparent scientific stature, and we do like to have our friends grouped about us when in the public eye.

Headings

Four stages of improving headings are apparent in today's medical periodicals. We are in the third phase. Figure 7 shows the rigidly-centered and overly-balanced simplicity of an unimaginative period. From the title in Figure 7 you will know that there is an interesting photo hidden in the presentation. This could have been used to dress up the entrance-way for a prospective reader. Figure 8 represents a minimum of flexibility concerning headings and would seem to be simple enough if you were not trying to bring about the switch from Figure 7 to Figure 8 in a journal. After all, how many centuries passed while man progressed from scratching pictures of animals in stone to executing abstract art in oil? Figures 9 to 15 represent what our abilities and budget permit at the present time.

It will be noted that in most instances no additional space is required for a given manuscript. A continuity of styles in print is, at present, a feature of our headings and contrasts with the variation in staging of the elements utilized to avoid any duplication of general appearance in a given issue. This can be accomplished technically by the help of a chart illustrating many of the possible variations for a given-sized space. Dynamic cropping and dramatic positioning of illustrations, boxes and defining features is an art and should be done by artists. However, we are functioning on a shoestring so that after the page proof leaves my desk I am never sure whether the final printing will bring pleasure or discouragement, thrills or anger. No "run arounds" (except for references) are permitted to disturb our readers at the ends of manuscripts. Thus the size of the heading is determined, in part, by the fraction of a page length remaining blank when the galley proof is pasted up from the end forward. The individual on the Board of Editors who reviews a manuscript writes the prefatory abstract or "blurb." The use of color and appropriate art drawings in our headings and body must await the future.

We have temporarily agreed to a second-choice style of body print. A font of a more masculine and more easily read style of type would cost our printer twenty-five hundred dollars ($2,500.00). Our margination, gutters and column width are now said to be good. A perfectly white paper stock similar to that used in *GP* and *Surgery, Gynecology and Obstetrics* is a must for the future.

To my amazement, a few months ago at the

time the Federal Government insisted upon a continuous numbering of pages of advertising with pages of scientific and business matters, there suddenly appeared in our journal, an entirely new numbering system, and a wild distribution of valuable editorial information among advertisements in the rear of the publication. This unauthorized mutilation of the 1959 volume of our journal can never be corrected. No one can predict from which direction the next storm will blow.

The need for many alterations in the present uninspiring headings of feature sections of the journal must await the birth of inspiration and knowledge in the editor and the Board or the employment of specialized talent. A start may be the insignia (Fig. 16). This is a frank copy of others and excusable only on the theory that to become an expert one must first imitate the experts.

Procurement

Much of the early efforts of the Board of Editors was expended in locating sufficient numbers of manuscripts to keep the monthly periodical in print. A principal obstacle to obtaining manuscripts was long-established frictions between large segments of the physicians of the state. It must suffice to say that at one time two medical organizations vied to represent physicians in the state. In a separate conflict, two journals represented two opposing groups. Removing the editorship to neutral territory (Duluth) six years ago plucked a thorn so that a wound might heal. We remain in a desperate struggle with the locally lay-owned but medically-supported magazine *(The Journal Lancet)* with its well-trained, full-time, specialized personnel, access to printing presses for special services, prestige through published names for medical sponsorship, financial backing for possible research grants and the will to survive. The limited circulation of most state journals, as compared to a few national publications, is a continuous handicap to the former. Editorials written on the problems of the society's publication, solicitation of intra-state medical societies for their support, conduction of a Readers' Interest Survey, and finally, a simple highly successful method of personal solicitation of those individuals presenting medical subjects thought to be suitable for our journal at the many medical meetings in the state, resulted in a good flow of excellent material. The publication of two supplementary issues (Fig. 17 and Fig. 18) became a pleasing and necessary service to our readers. The extra manuscripts permitted more discrimination in the selection of those published. More space was needed. Severe limitation of the publication of a "History of Medicine in Minnesota" and a partial reversal of a policy of printing new book reviews (free advertising for publishers) helped provide space for items of greater value to our readers (their choice).

The Readers' Interest Survey (Fig. 19) conducted at an annual meeting by the Research Division of the School of Journalism of the University of Minnesota enlightened us on many things. These included the fact that our monthly MINNESOTA MEDICINE was read by the physicians of our state more than the weekly *Journal of the American Medical Association*. No other single journal came near these two in usage. However, the third in line was a pocket-sized "throw away," a lay commercial periodical specializing in summarizations of legitimate medical publications. Within the decade, many of these parasites of medical journals have cunningly played upon a strong universal trait of man. It has not only become an accepted custom but an honor to up-grade the covers and pages of their magazine with personal pictures and names of medical celebrities.



The order of preference of parts of the journal revealed by the survey was: table of contents, regu-

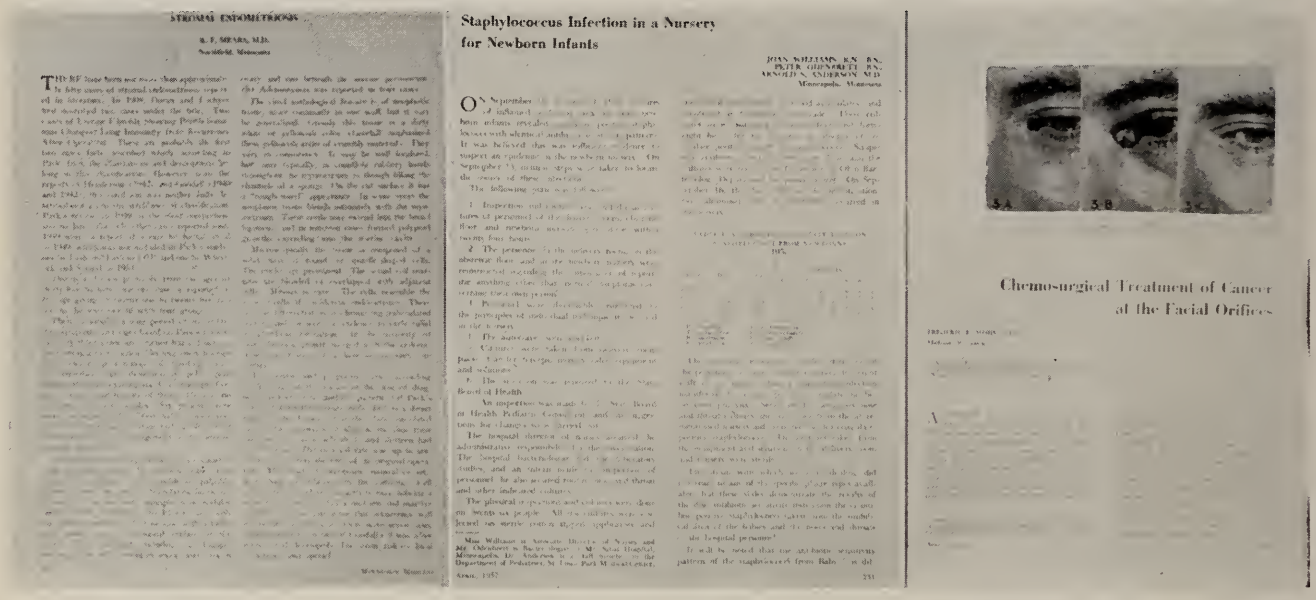
lar scientific articles, editorials, physician's diary. . . . There was a strong demand for brief concise summaries on applied medicine. We have attempted to fulfill this educational need, now partly supplied by the "commercials," through promoting a section on Current Concepts. Much better organization of the voluntary assistance in this field of procurement is needed in the future.

An annual audit of the journal for the frequency of subject matter of scientific manuscripts in the various specialties of medicine permits a concentration of procurement efforts in the poorly-represented disciplines of medicine. Thus, a continued series of manuscripts appeared on accidents of childhood initiated by the pediatrician on the Board of Editors. A long-felt need for a section on Public Relations was realized when such a person joined the Executive Staff of the State Medical Association office. Business functions are now partly covered by summaries written by chairmen of the various committees of the Association in a section designated as Committee Action.

The true value and importance of organized medicine, including its principal media of communication, is learned early in Minnesota since the Association now gives the journal to the members of the junior and senior classes in medicine at the University of Minnesota.

In spite of the temporary success in the procurement of a quantity of printable matter, the Board of Editors has much to learn and do. Our greatest usefulness to the busy generalist would be the production of a dependable authoritative source of concise informative reviews of recent concepts in applied medicine. We are pitifully lacking in manuscripts covering clinical research in applied medicine including: signs, symptoms, laboratory procedures and therapy as they have been observed in diseases in significantly large groups of patients. Here is the ideal area where the group as a whole could subsidize the individual thus promoting both research and education in its most popular form.

A news section in addition to our popular Physicians' Diary would please many readers and close a gap of time. The section on Medical Progress (a complete coverage of a limited subject) requires much more planning in advance.



Editorials on the numerous controversial political, business and scientific aspects of medicine could, in themselves, carry a medical journal to fame and be of unestimable service to medicine.

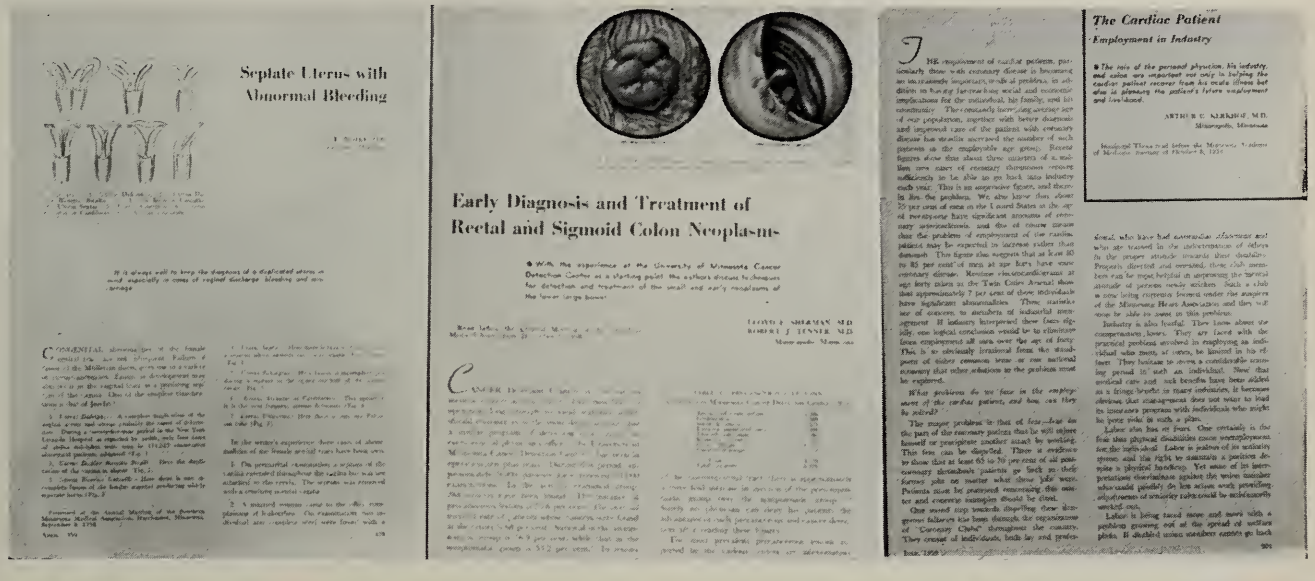
Editing

The Board of Editors has been fortunate in having among its members a physician who is a specialist in editing from the Section on Publications of the Mayo Clinic. A routine review of editorial errors in past issues has been a continuous and frequently depressing feature of the bimonthly meetings of the Board. Multiple editings of manuscripts by the individuals on the Board of Editors and the lay writers hired by the publishing company, simply divided the responsibility for errors. It was not until specific responsibilities were agreed upon that a decided improvement occurred. The responsibilities were assigned to best utilize the specialized training of the voluntary

physicians of the Board and the professional lay editors of the publisher. We still have no means of checking references or the volume index.

The ever-popular Case Report remains "the short change in medical education which is its capital." Our acceptance of manuscripts is prejudiced in favor of publishing the case reports of isolated physicians. Special funds are available for rewriting, transcribing and producing illustrations for this group of doctors located in large cities as often as in small communities. One of the basic purposes of our journal is to permit and encourage self expression of the membership.

concentrated effort on the scientific aspects of medicine given freely by the authors. The adherence to the unwritten laws of this ancient heritage have resulted in an "accelerating acceleration" of new discoveries ever more practical and helpful to man. The advancements of each decade outdo the previous by a large margin. Medical educators are in a continuous state of flux trying to crowd ever more and the most important of this information in the same four years of training. Physicians in general practice or the specialties are frequently bewildered by the continuous stream of practical knowledge. The ways and means of



We do not aspire to the publication of perfect English. We try to publish the unmistakable meaning of the author and to help him clarify and simplify sentence structure. The spelling and punctuation should be reasonably good. To assure a uniformity of bibliographic references and illustrations, we publish instructions to authors in each issue. Greater attention must be paid to requiring a summary which summarizes. The data in tables and text should coincide. Brevity must be enforced. At present, this can not be done to the pleasing degree which characterizes the *American Journal of the Medical Sciences.* To create a a literary style is beyond our ken and purpose.

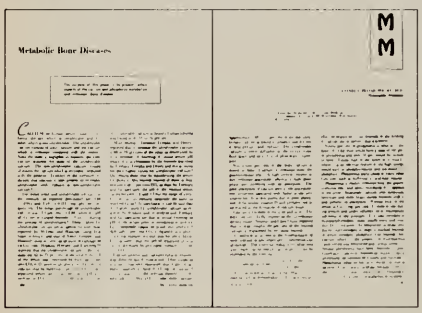
Financing

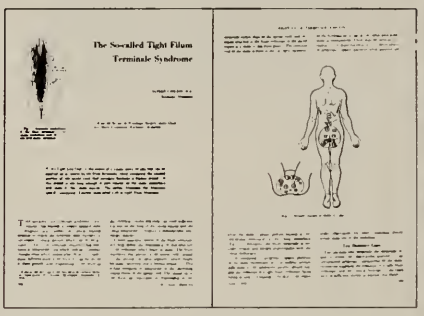
Few customs of man are quite so idealistic and beneficial as the free exchange of knowledge concerning medical diagnosis and care. Each issue of our journal represents hundreds of hours of

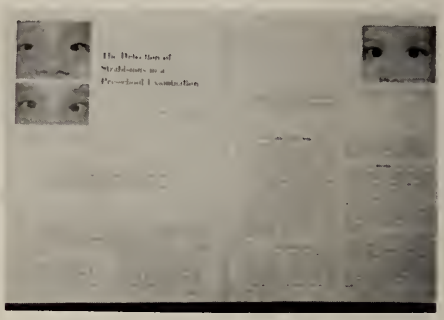
making it possible to efficiently communicate this vital information to the practicing physician is becoming an ever-increasing problem. In especially urgent situations, such as staphylococcus sepsis in hospitals, the Federal Government and private agencies have subsidized research and the collection and distribution of clinical and laboratory findings of many sources. Most medical journals must depend upon advertising to help carry the heavy burden of publication costs.

It is essential that the financing of medical journals be handled in such a way as to protect the dedicated purpose of the publication. In Minnesota, no one physician or group knows the basic details of the financial aspects of the official journal. Here we remain babes in the woods. A committee appointed for the purpose follows fifteen years of benevolent and trusting tradition of no interest, no knowledge, no ability, and no action, yet emotionally brittle—in other words, "all thalamus and no cortex." This is a common descrip-

tion of committee action in many fields of interest and does not necessarily reflect on individuals in the committees. Our printer runs the show, collects the money and makes the reports. The percentages of give and take on this and that are all his worries, not ours. Economic matters pertaining to: exchange journals, distribution of extra journals in foreign countries, promotion of circulation, differential rates for professional and commercial advertisements, subscription price, the economics concerned in methods of printing, grades of paper, uses of color, mailing procedures, delayed publication of practically every issue, knowledge of various types of agreements with printers,







the criteria for selecting good printing companies, cost factors using color for line drawings in headings, the color "borrowed" from adjacent advertising, maintenance of comparative annual committee records, criteria, need and promotion of advertising adjacent to editorial matters, a critical check of each issue for weaknesses and areas of conflict between science and advertising, et cetera, would be fundamental to any organized business, but apparently not to "organized" medicine. Austin Smith once saved the American Medical Association over $100,000.00 a year by a simple change to a grade of paper not detectably different from that which had been in use.

There is no business or profession so keenly alert to the value of specialized talent necessary and the new products of research in its own field as is medicine. The new and eminently efficient techniques in communications including video-tape and pay television, not to mention the "memory" of an IBM robot, are now putting the finger on the State Medical Association. These advancements in means of communication must be put to work as soon as possible to handle those types of medical education best suited to their nature. New sources of money must be found. The same idealistic humanitarian policies of management and control must be maintained.

Future Organization

Like any other business, the basic departments responsible for the success of a medical journal must work together. In a journalistic enterprise, the editor-in-chief is the natural person to be responsible for co-ordinated action. The survival of an individual or a department, the product of defective political practices or poor judgment would be the editor's responsibility and not his enforced burden. To stimulate originality and progress, each department should have a chairman selected by the editor. These chairmen should constitute an executive committee with special periodic educational requirements. A paid journalist should be the executive editor and a guiding light to the voluntary medically-trained editor and members of the Board of Editors. A partially self-explanatory diagram is shown in Figure 20.

Conclusions

In the past, physicians have underestimated the value of modern typographic methods in documentation of their scientific advancements. It is apparent that they are not only pleased with the new manner of displaying their works, but will eventually demand it. The increased usefulness through a scientifically-correct method, and the reduced costs through increased circulation and advertising will eventually threaten the very existence of the less progressive medical journals wishing momentarily to attract and hold the minds of men. Beyond this, newer and more efficient techniques of communication combining oral and visual stimulation (such as in video-tape) may eventually, at least in part, replace the customary written word.

Six years of personal experiences with the roadblocks of long-established customs as editor-in-chief of a state medical journal briefly outlined in

the text leads to the following plea for a hearing.

Doctor, consider these twelve observations for their worth. They are directed at you and your State Medical Association.

1. The best in all fields of applied medicine is a nearly fantastically changing body of knowledge.

2. You strive desperately to ride the crest of this rapidly-moving wave of scientific progress.

3. This knowledge and the ability to use it is your stock-in-trade as well as a principal means to satisfy any need you may have to do something for others.

4. You welcome any relief in this life-time struggle to keep abreast and supply the best.

5. The nearly universal recognition of the importance of postgraduate education is reflected in the fact that it is considered the first function of nearly all medical organizations.

6. The two principal methods of participation of the Minnesota State Medical Association in this field are its journal and the annual meeting. Both have been receiving a minimum of support.

7. The resulting void has caused an accelerating trend for other societies, institutions and commercial organizations to take over this service basic to the practice of medicine.

8. Assimilation, digestion and retention of knowledge is a primary function of a science concerned with efficient and accurate communication.

9. Thanks mainly to the research and ingenuity of non-medical men, we are now at the threshold of a new era in communication.

10. Organized medicine at the state level must grasp this life preserver which has suddenly and miraculously appeared on the presently all-consuming waters of business in medicine.

11. The proper control and promotion of some

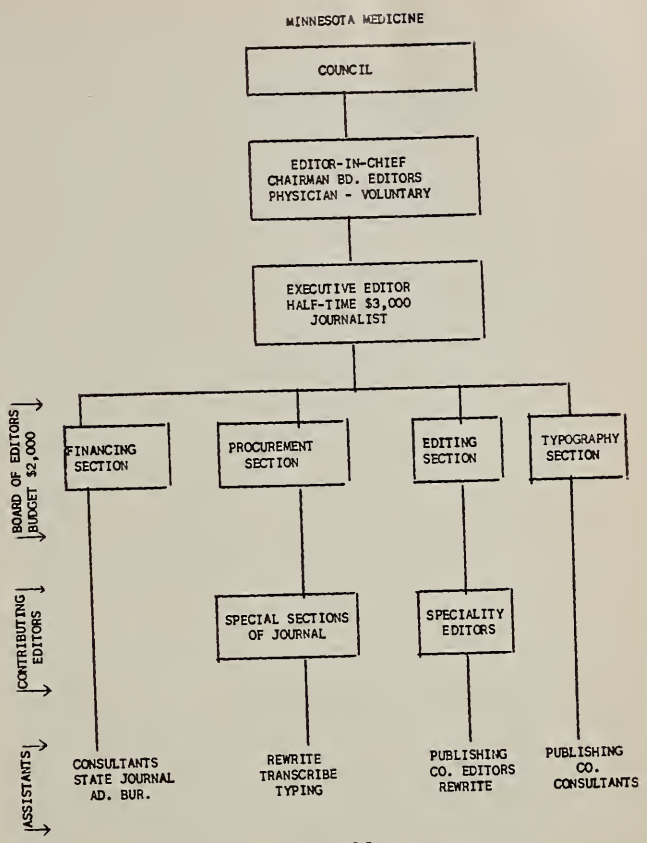


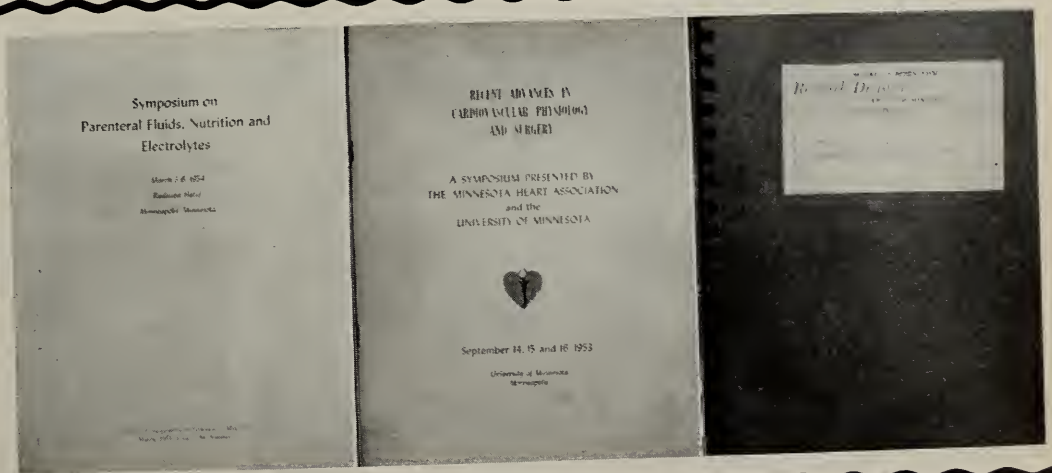
Fig. 20

of the new forms of communication of medical science is now within the reach of the State Association and through it eventually the coordinated action of the AMA and other states to utilize the talent of the nation.

12. Success in the organization and control of the usage of the recently-established pay television, video tape, modern journalism and other developments in the science of semantics will depend upon a radically new and informed approach to what today more than ever before is the first function of the State Medical Association.



Figs. 17, 18, 19



Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.
Henry G. Moehring, M.D.

HOMICIDE

A Legal and Social Study of Victims and Assailants

A Law-Medicine Center reflects inter-disciplinary thought not only in instruction but also research. The Center in Cleveland utilized this fact for its first major research project—a study of homicide in the urban, industrial community of Greater Cleveland. Major contributions to this project were made by the Coroners Office (forensic pathology and forensic toxicology) and the sociology, social work as well as law faculties of the University. Identification of the real cause and manner of death, not the apparent, can only be achieved in a scientific laboratory like the Cuyahoga Coroner's Office. Given this information, a study of the County Prosecutor's records for the seven years' covering the homicide study revealed the manner in which the legal process handled the 662 cases which emerged. Once identifying these 662 cases, a sociological study of the victims, assailants and neighborhood crime scenes involved in the individual homocides was undertaken. The mass of data collected produced interesting facts: 450 of the 662 incidents were felonious homicides, 157 were justifiable, 51 could not be classified; the police apprehended 95.5 per cent of all assailants; 26.3 per cent were convicted as charged, 45.5 per cent were convicted of lesser offenses, 28.2 per cent were found not guilty; 76 per cent of the felonious homicides were committed by Negroes who represented 10.7 per cent of the Greater Cleveland population; no significant differences with respect to the disposition of the criminal cases of white and Negro defendants appeared; women accounted for only 13.9 per cent of the felonious homicides; male defendants had a 10 per cent higher conviction rate than females; only 13 per cent of males eligible for probation were granted such but 40 per cent of the females were so favored; 50 per cent of the victims had alcohol in their body; 55 per cent of the homicides were caused by firearms, cutting and piercing instruments were used in 25 per cent of the cases and blunt instruments in 7 per cent. In the overwhelming number of cases the homicides were produced by (1) quarrels of a mostly petty nature, (2) marital discords in which one spouse kills the other, and (3) love or sex disputes in which the deceased was slain by one other than the spouse or "common law" mate. Such legal research is valuable for several reasons. The administration of criminal justice, particularly for homicide, can be evaluated. Corrections in legal procedures or enforcement techniques are possible. In a nation like ours, without a Ministry of Justice as in some European states, improvement in criminal justice administration is sporadic, disorganized and often irresponsible to say the least. Inquiring minds in a University environment can make major contributions to progress in criminal justice through inter-disciplinary research.

The same holds true for the social aspects of homicide—to remove the causes of the crime and prevent their occurrences. From the legal research, Negroes would appear to be the major cause of homicides in the urban community. The social study eloquently refutes this gross observation. The homicide rate in Negro areas differs greatly. In one area it is three times the rate found in another area. What other differences are revealed between these two areas of Negroes? The area with the lower homicide rate has nearly $700 more in median family income, three years more of education completed, 11 per cent less density of persons per net acre of living space, 30 per cent less substandard housing, three times as many owner occupied dwellings, over 20 per cent less infant mortality and tuberculosis cases, 55 per cent less illegitimate births, 70 per cent less overcrowded housing.

It is not the color of skin but the economic, social and cultural environment which are controlling factors in homicide areas. To interpret this fact with supporting data could go a long way to resolve a major domestic issue confronting America—the relationship of Negro and white citizens expecially in our Northern urban, industrial areas. With knowledge of the changes in employment practices to result from further revolution in industry—automation, the impelling need today is to comprehend the problem of more

leisure time, more unemployable persons because of lack of intellectual capacity. From the homicide study, leisure time for unskilled workers contributes to the homicide incidents. Basic thought in such areas as mental development, educational practices and governmental policies is vital if the whole crime problem as reflected by the homicide study is not to conquer us through the replacement of the free society by the slave society.

This primary homicide study soon to be published in book form actually asks more questions than it answers. Virgin territory was tilled, the first crop is not always the finest quality. Continued investigative labor in a University environment with co-operation of concerned public offices and private agencies will provide more and better data and opinions. The ancient problem of man's slaying man may well succumb to modern intellectual attack when the inter-disciplinary army advances. The Law-Medicine Center is one component of that army.

Oliver Schroeder, Jr.
Director, Law-Medicine Center
Western Reserve University

INTERMITTENT POSITIVE PRESSURE BREATHING (IPPB/I)

Intermittent Positive Pressure Breathing Therapy is a matter of progressively increasing interest and controversy. Manufacturers of various commercial devices in this field report a steady increase in demand for such apparatus, and in November, 1959, they met with The American Association of Inhalation Therapists in Philadelphia to discuss inhalation therapy, much of it related to intermittent positive pressure breathing.

Pressure breathing dates back to mouth-to-mouth resuscitation in Biblical times at least. Since then various forms of pressure breathing have been used and accepted in artificial respiration, infant resuscitation, pressure face masks, compression of the bag by anesthesiologists, the Drinker Respirator, and numerous other breathing and resuscitator devices. It is apparent, however, that the pressure application is not the same in all of these accepted uses, and therein lies the first source of misunderstanding in pressure breathing. In any discussion of this subject it is imperative that the exact type and application of pressure be defined before understanding and evaluation can be made.

Much of the present clinical interest centers around Intermittent Positive Pressure Breathing in which there is a gas flow under positive pressure during the inspiratory phase only, (i. e. IPPB/I), expiration being entirely passive. Commercial devices to accomplish this are numerous and they generally incorporate an aerosol nebulizer in the pressure circuit. Bronchodilator, detergent, and/or antibiotic agents are the usual therapeutic aerosols. Application is by face mask or mouthpiece.

The clinical situations in which the use of IPPB/I has been effective include:

1. *Chronic Pulmonary Disease.*—Emphysema, silicosis, bronchiectasis, bronchitis, asthma, and other infectious or bronchospastic alterations of the lungs are frequently much improved by this combined pressure and aerosol treatment.

2. *Hypoventilation.*—Post-surgical patients, particularly those with abdominal incisions, present markedly reduced vital capacities which encourage the complications of atelectasis and pneumonitis. Pressure breathing is effective in preventing such complications. The hypoventilation of neurological disorders, such as poliomyelitis and Guillain-Barré syndrome, can be greatly relieved by this mechanical assistance. For reduced ventilation in coma, and barbiturate intoxication, or in instances of complete apnea, the use of pressure breathing can be life-saving.

3. *Intoxication.*—Excessive gas accumulations, particularly carbon dioxide in the carbon dioxide narcosis syndrome, and even alcoholic excesses can be relieved by hyperventilation with intermittent positive pressure breathing of this type.

4. *Pulmonary Edema.*—Improved ventilation with the addition of the small pressure gradients of IPPB/I have been found to be therapeutically effective, in various types of pulmonary edema.

5. *Crush Injuries of the Chest.*—The use of pressure breathing, with or without tracheostomy, has provided comfortable ventilation for these patients whose ability to accomplish this on their own has been seriously compromised.

6. *Intractable, Non-productive Cough.*—The use of IPPB/I on the patient with a persistent bronchial irritation following an upper respiratory infection has been empirical but frequently helpful.

7. *Diagnostic Test.*—The effectiveness of ventilation with IPPB/I has been used in the determination of maximum blood oxygen saturation for the diagnosis of vascular shunts.

Many of these applications of IPPB/I depend for their effectiveness on the combination of increased ventilation and dispersal of aerosol medications. Whether their dispersal with pressure is more effective than the simple voluntary ventilation methods of accomplishing the same purpose is a point of debate and varies with individual patients. Other uses of IPPB/I depend for their effectiveness on the production of maximum ventilation per se, as in poliomyelitis and barbiturate intoxication, post-surgical pulmonary complications, and pulmonary edema. Whether the machine accomplishes all of this alone or is primarily a fulcrum for increased personnel attention to ventilation and the bronchial toilet, is another point of debate.

There is no doubt that many good results can be accomplished without pressure breathing apparatus, as the British do, by the application of proper physiotherapy techniques. However, the present shortage of trained personnel and nurses in our American hospitals has made the use of this mechanical device a practical vehicle for the management and prevention of these pulmonary problems. The physiotherapists, furthermore, have welcomed the addition of pressure breathing apparatus as an effective adjunct to their program.

IPPB/I has been used in The Buffalo General Hospital for over 6 years, with a total of 28,000 patient days of treatment with 32 machines. The incidence of post-operative atelectasis by record room statistics has been diminished, while the improvement in the cases of chronic pulmonary emphysema has been equally, but not universally, demonstrated. At present a study is under way to evaluate its effectiveness in the distribution of combined antibiotics and enzymes for improvement in the intractable pulmonary infections and results to date have been encouraging. So far, there have been only three known instances in this hospital of pneumothorax coincident with the use of IPPB/I. No other complications have been noted with any significant frequency.

On the basis of this experience it is felt that IPPB/I is a safe, effective method of accomplishing good clinical results in the situations outlined above. It is useful, however, only if (1) it is used for the proper indications, and (2) it is applied with the proper technique.

THEODORE H. NOEHREN, M.D.
Assistant Professor Internal Medicine
University of Buffalo School of Medicine

CLEFT LIP AND CLEFT PALATE

There is a bright future ahead for the 4,000 babies who will be born in the United States with cleft lip and cleft palate during 1960.

This hopeful outlook is revealed by Eugene T. McDonald, Ed.D., prominent speech and hearing specialist and director of the Speech and Hearing Clinic at the Pennsylvania State University, in "Bright Promise"—just published by the National Society for Crippled Children and Adults.

The advances in surgery have made it possible to repair lips and make adequate functions possible in many palates. Dental techniques have been developed for reconstructing by prosthetic means those palates which cannot be repaired surgically. Speech therapists today know how to help children with cleft palates develop good speech. Furthermore, there are helpful sources for information on problems of cleft palate, as well as resources for treatment, including state and local Easter Seal societies, state crippled children's services, many public schools in metropolitan areas and the speech clinics at colleges and universities.

Well illustrated with diagrams and "before and after" illustrations, "Bright Promise" traces causes of cleft lip and cleft palate, describes four major types and follows through on some of the technical advances in corrective procedures.

In pointing to studies of personalities of children with clefts, Dr. McDonald stresses that, as a group, they are as well adjusted as other children. "Probably of greater importance than the child's cleft in determining his emotional adjustment is the way in which his parents work out their own feeling toward it. An understanding of these feelings—their beginning and how they grow —will help parents direct their feelings into wholesome channels."

Dr. McDonald is a past president of the American Association for Cleft Palate Rehabilitation and a member of the professional advisory committee of both the National and Pennsylvania Societies for Crippled Children and Adults. He is widely known as an authoritative speaker and is the author of many articles and books on speech and hearing.

Copies of "Bright Promise" at 25 cents each may be secured by writing the Publications Office, National Society for Crippled Children and Adults, 2023 W. Ogden Ave., Chicago 12, Illinois.

WIND CHILL

The Army Surgeon General's Office has issued revised instructions for use with its Wind Chill Table, first published in November, 1958, to provide information on the effect of cold temperatures and wind on military personnel.

The revision clarifies the term "wind chill" to mean the *rate of cooling* which occurs when exposed or inadequately protected flesh is subjected to certain temperatures and wind speeds.

The Wind Chill Table, originally based on studies made at the U. S. Army Medical Research Laboratory, Ft. Knox, Kentucky, provides the unit commander, having the temperature and wind speed forecasts, with a ready means of computing the temperature equivalent against which he must protect his men. With these data he can reduce the incidence of cold injuries among troops during cold weather.

The table shows, for example, that if the temperature is expected to be 35 degrees Fahrenheit and the expected wind velocity is about 20 miles per hour, the *rate of cooling* of all exposed flesh is the same as at 38 degrees below zero with no wind.

The new instructions state that though equivalent wind chill figures of 23 degrees, 0 degrees or even –40 degrees are below the freezing point of water, this does not mean that all exposed flesh will freeze solid or that even the surface will be frozen. On the other hand, all unprotected flesh exposed to actual temperatures below 20 degrees F. regardless of wind speed, may freeze.

Exposure to temperatures between 50 degrees and 20 degrees F. may result in cold injury of a type less severe than actual freezing. Examples are chilblains, trench foot, and immersion foot.

The wind chill table and revised directions for its use are being published in DA Circular 40-47, dated 31 December 1959.

Although the revised information provided in the circular is not considered to be complete, it is the best currently available. Continuing research is being conducted by various military and civilian research agencies; and the results of their findings will be available in the near future.

WIND CHILL

Table of Equivalent Temperatures on Exposed Flesh at Varying Wind Velocity

Wind Velocity (miles per hour)										
45	35	25	20	15	10	5	3	2	1	0
90°	89.5°	89°	88.5°	88°	88.75°	87.5°	87°	86°	84.5°	83°
82°	81	80.5	80	79.5	78	76	74	72.5	70	60
72°	71	69.5	68	67	65	60	57	53.5	47.5	23
63°	61	59	57	55	52	44.5	39	34.5	20	–11
51°	49	47	45	42.5	38	28	18.5	11	0	–27
41°	39	36	34	30.5	25	11	0	–9	–23.5	–38
									Below	Below
30°	28	25	23	18	11	–5	–16.5	–40	–40	–40
								Below		
20°	18	14	11	6	–2	–19	–40	–40	do	do
							Below			
10°	7.5	3	0	–6	–15	–35	–40	do	do	do
						Below				
0°	–2.5	–8	–12	–18	–29	–40	do	do	do	do
					Below					
–11°	–14	–18	–23	–30	–40	do	do	do	do	do
				Below						
–21	–24	–30	–35	–40	do	do	do	do	do	do
–32°	–35	–40	–40	....	....	....	do	do	do	....

INSTRUCTIONS FOR USE OF THE TABLE

1. First obtain the temperature and wind velocity forecast data.
2. Locate the number at the top corresponding to the expected wind speed (or the number closest to this).
3. Read down this column until the number corresponding to the expected temperature (or the number closest to this) is reached.
4. From this point follow across to the right on the same line until the last number is reached under the column marked zero (0) wind speed.
5. This is the equivalent temperature reading. Example: weather information gives the expected temperature (at a given time, such as midnight) to be 35° F. and the expected wind speed (at the same time, midnight) to be 20 miles per hour (mph). Locate the 20 mph column at the top, follow down this column to the number nearest to 35° F. The nearest number is 34° F. From this point, move all the way to the right on the same line and find the last number, which is –38° F. This means that with a temperature of 35° F. and a wind of 20 mph, the *rate of cooling* of all exposed flesh is the same as –38° F. with no wind.

President's Letter

THE PHYSICIAN AND ORGANIZED MEDICINE

History of medicine from the earliest times to the present constantly recognizes the special nature of the relationship of physicians to one another and to their patients. Free exchange of knowledge among the early physicians served to set them apart from the charlatans and quacks of the period.

Constant concern for the patients' welfare motivated the physicians of the pre-revolutionary period in this country to organize. The first medical societies were founded in Boston in 1735, in New York City in 1749, in Philadelphia in 1765, and in New York again about 1769. The American Medical Society in Philadelphia in 1773, others in New Jersey, 1766; Massachusetts, 1781; South Carolina, 1789; Delaware, 1789; New Hampshire, 1791; Connecticut, 1792; Maryland, 1798; and in Minnesota in 1853.

The societies of New Jersey, Massachusetts and Philadelphia began early to issue records and transactions of their meetings.

Recognition of the necessity for a strong, active national organization came to fulfillment after years of effort in 1847, when the American Medical Association came into being for the purpose of promoting the science and art of medicine and the betterment of public health. The AMA serves a truly democratic organization acting through the House of Delegates, who represent the constituent state associations. At the present time, additional delegates are selected by the Sections of Scientific Assembly and of delegates from the Medical Department of the U. S. Army, Navy, Air Force, Public Health Service and the Veterans Administration. These appointments are made by the Surgeon General or Chief Medical Director of the respective services. Each delegate to the national organization (AMA) represents 1,000 active members or fraction thereof in his state. Thus, Minnesota with its 3,379 active members, has four delegates elected by the House of Delegates of the State Association.

Our State Association and its structures are well known to the membership. Each State Association has similar constitutions with variations to fit local desires and conditions.

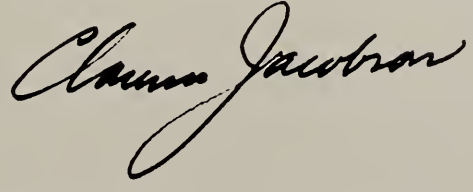
Minnesota has thirty-three county medical societies. These county medical societies continue to be the activating element in our State and National organization. Here the individual physician can propose, protest or condemn. He is never denied a voice in the proceedings. His cause, meeting the approval of his fellow members, can be carried to the State House of Delegates or the Council and on to the floor of the House of Delegates of the AMA by the instructed State delegation.

The Council of the state organization, elected by the House of Delegates, meets during the interim between the sessions of the House of Delegates. Members of

the Council are authorized to perform all actions and functions which the House of Delegates might do or perform. Councilors are often called on short notice to meet situations and to act if necessary on problems and proposals which may arise and demand prompt attention. These are a dedicated group of men. Many travel long distances, often disregarding important personal obligations. The agenda during these week-end meetings may include a request for approval of new undertakings by related medical and lay groups, individuals, local and state governmental agencies, also proposals or complaints with medical aspects. Consideration of these items is frequently far-reaching and searching. Organized medicine in our state and nation continues to enable the doctor to render his patient medical care according to standards which are constantly a challenge to his abilities. We all know of the forces which wish to appropriate themselves these privileges to enhance their political or financial stature. To prevail is our objective. Our continued efforts to prevent exploitation of medical ideals demand careful scrutiny of changing economic and social movements so often presented in attractive legislative proposals, i.e., the Forand Bill. Determination to resolve intelligently dissention will enable the profession to render the patient service which from time immemorial has been its privilege and duty to perform. Free professional competition, enabling the patient to choose his own doctor or groups of doctors, is a right which, if denied, will mark the beginning of decline in the quality of medical care. Exploitation of both doctors and patients will follow as witnessed in areas and countries where the special nature of the relationship of the physicians to one another and their patients has been abandoned for politically inspired socio-economic measures.

A physician may enjoy an increased measure of security by virtue of membership in the state association through additional services rendered him. These benefits include an insurance program which approaches complete coverage for the doctor and his family. The professional liability portion of this insurance program has been eminently successful. Diligent work by the appointed committees involved has resulted in giving a maximum coverage for a reasonable premium. Other advantages afforded through the county medical society, Minnesota State Medical Association and the AMA are the twenty-three scientific and twenty non-scientific committees of the Association. These committees are intended to enhance the stature and ability of the Association. Reports of the committees are presented by the respective chairmen at the annual meeting. Contents of these reports often reveal the scope and interest of organized medicine in the welfare of the public they serve.

We can truthfully say organized medicine came into being for an eminently useful purpose; community welfare, community health, and scientific education. It will continue to work effectively to maintain the freedom so necessary for accomplishing these ends.



President, Minnesota State Medical Association

Civil Defense News

CARL WALDRON, M.D., D.D.S., *Chairman, Civil Defense and Disaster Committee, Minnesota State Medical Association*

M. D. TYSON, *Civil Defense Co-ordinator, Minnesota State Department of Health*

Pursuant to a contract dated July 26, 1957, between the United States Government and the American Medical Association, the AMA agreed to "develop and recommend the planning, training and operational organization needed as a basis for a National Emergency Medical Care Plan for the treatment and care of casualties and non-casualties prior to, during and after a hypothetical 20 megaton ground burst thermonuclear attack upon a selected geographical area or areas in the United States." The contract specifically called for recommendations of the AMA covering six major areas:

1. An organizational plan which would result in the optimum of medical care.
2. The utilization of professional and non-professional personnel of the medical and related professions to carry out the plan.
3. The responsibilities of the medical profession in the pre-attack and post-attack period.
4. Those functions of the medical profession that may properly be delegated and performed by paramedical personnel.
5. The training and education needed by all health personnel, professional and non-professional, so that they may be prepared for operational capability in the event of enemy attack.
6. The post-attack sorting of casualties.

The Minnesota Civil Defense Medical Plan and the St. Paul-Minneapolis Target Area were selected for the study area. The report, dated April 15, 1959, states,

"Among the reasons the Minnesota plan was selected for study were its high quality, thoroughness of preparation and its state of being recently prepared.

"Examination of the Health and Medical portion of the Minnesota Operational Survival Plan does not point the way to any clear-cut plan adaptable to all states. . . . It does, however, give some indication of the tremendous amount of minutia, co-ordination of applied effort and difficult-to-obtain information which must go into the making of a plan. The Minnesota planners should be commended on the results of their effort. However, it should be realized by all concerned that a similar plan would not necessarily be adaptable to any other state.

"A whole blood program is essential to medical planning for the care of mass casualties," and "survival planning must insure that adequate equipment for collecting and administering whole blood is located strategically in accessible but safe areas.

"The role of the medical profession is to prepare its members to cope effectively with the results of a mass attack on the United States and to assist actively in preparing the Nation to withstand such an attack. In the event of a mass attack on this country, the role of the medical profession is to provide to the Nation the highest quality and best organized curative and preventive medical services possible in order that maximum numbers of physically and mentally fit survivors, imbued with high morale and a courageous spirit, are and will become available to assume their share of responsibility in the ensuing national recovery efforts and to participate in concurrent and subsequent combat operations.

"Regardless of other factors, any plan for survival will be of little value without adequate training of personnel who are to execute the plan. A training plan must logically follow its preparation. In event of a massive attack upon the United States or its territories, there will be no time to make plans or to train. Training must be initiated early and conducted constantly. It must cover the subjects of mass casualty and non-casualty care not common to current medical training and practice."

The report includes a comprehensive group of recommendations, principles and organizational plans required to accomplish the planning, training and operational organization needed as a basis for a National Emergency Medical Care Plan, for the Federal Government and the States.

In his letter transmitting the report to Leo A. Hoegh, Director, Office of Civil and Defense Mobilization, Dr. F. J. L. Blasingame, Executive Vice President, American Medical Association, stated:

"The report recommends that a national medical civil defense plan be initiated and co-ordinated at the national level and that the Federal Government assume the primary role of guidance and co-ordination of the total national effort. Such a plan, under current concepts as enunciated in Public Law 606, 85th Congress, which makes civil defense a joint responsibility, would be implemented by the Federal Government, the several states and their political subdivisions. The Association assures you of its continued willingness to co-operate and assist in every way possible in preparing the nation, medically, to survive and recover in the event of enemy attack."

The Michigan State Medical Association has been very active in Civil Defense. In a letter dated September 15, 1958, addressed to the Presidents of the component County Medical Societies, the then President of the MSMA, Dr. H. B. Sweetser, wrote: "The MSMA endorses and will give its full support to the implementation of the State Medical Survival Plan." On January 1, 1959, the MSMA established a separate Committee on Civil Defense and Civilian Disaster. In May, 1959, the Resolution Committee, the Council, and the House of Delegates of the MSMA passed two resolutions:

Resolution Number 1

WHEREAS, in the event of a Civil Defense or Civilian Disaster emergency many lay persons will be needed to provide medical care and public health services, and WHEREAS, lay persons need pre-emergency training,

(Continued on Page 144)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

"PILL BILL" TRIAL ENDS AFTER FOURTEEN WEEKS OF TESTIMONY

The question of whether familiar over-the-counter preparations such as Anacin and Alka Seltzer are true "proprietary" drugs and medicines was a critical issue during the final stages of the significant Minnesota legal battle concerning unregulated sales of drug products by a food chain and a wholesale rack jobber. The trial ended December 16 after fourteen weeks of testimony.

In place of closing arguments, Judge William C. Larson, Hennepin County District Court, Minneapolis, Minnesota, asked opposing counsel to submit summary briefs by January 20.

Testimony by authorities on medicine, pharmaceutical chemistry, and drug manufacturing conflicted sharply with claims concerning "secret" formulas and processes made by officials of major manufacturers of over-the-counter products.

The state, which brought the case on behalf of the Minnesota Pharmacy Board, called expert witnesses in support of its contention that the products cannot be classified as "proprietary" since they can be compounded independently of any special knowledge possessed by the manufacturers.

Referring to the eighteen well-known products involved in the trial, all of which are commonly termed "proprietaries," Dr. Thomas B. Magath, Head of the Section of Clinical Pathology, Mayo Clinic, testified that he could produce identical or similar products in his laboratory, relying only on information supplied by labels and obtained through chemical analysis.

Ole Gisvold, Ph.D., Professor of Pharmaceutical Chemistry at the University of Minnesota College of Pharmacy, said it was possible to make a qualitative and quantitative analysis of all products which would determine the identity and quantity of both their active and inactive ingredients.

Later, an expert on pharmaceutical manufacturing stated that the results of such analyses would enable him to manufacture identical or similar products.

This testimony came from Robert H. Miller, Ph.D., Professor of Pharmaceutical manufacturing at the College of Pharmacy. To corroborate his statement, Doctor Miller produced a number of what he described as "Alka Seltzer type tablets" which he said were compounded by a graduate student at the college. The Court refused to accept the tablets as evidence following vigorous objections by defense counsel.

The defendants, Red Owl, Inc., and Groves-Kelco, Inc., argued that the products they have been selling through unlicensed outlets are free from regulation under a provision of the state law which exempts from control by the Pharmacy Board, harmless, non-habit-forming proprietary drugs and medicines when labeled in accordance with state and federal laws.

The definition of the term "proprietary" and the question of habituation was crucial to both the state and the defense. Testimony by the state's expert witnesses on the possibility of duplicating the eighteen products was directed at this point. The last witness called by the state, Wallace F. White, Ph.D., of the University of Minnesota College of Pharmacy, testified that the products in question had habit-forming properties.

Drug Firm Officials Testified

The defense earlier presented a series of witnesses which included executives, medical consultants, pharmacologists, and chemists associated with the manufacturers of the drugs and medicines figuring in the case. Much of the questioning was directed toward establishing the proprietary character of the products.

Among those testifying on behalf of the defendants were Dr. George L. Woolcott, Medical Consultant to Wallace Laboratories, a Division of the Carter Company, manufacturers of Carters' Little Liver Pills; Dr. Raymond L. Conklin, Medical Director, Miles Laboratories, makers of Alka-Seltzer; Thomas B. Singleton, President of the Murine Company; Bernard T. Kearns, General Manager of the Pinex Company; John Alden, Vice President, Norwich Pharmacal Company, manufacturers of Pepto Bismol; and Stanley I. Clark, Executive Vice President of the Sterling

Drug Company, which manufactures Bromo Seltzer.

The importance of the proprietary question was underlined in the early stages of the trial when a defense witness refused to disclose the quantity of an ingredient contained in one of the products. Under cross-examination, Dr. Frederick G. Cullen, medical consultant to the Proprietary Association, declined to state the amount of potassium bicarbonate used in Murine on the grounds that to do so would be revealing a trade secret.

Judge Larson ruled that Dr. Cullen and other witnesses would not be required to divulge such information.

Medical Experts Called

The State, with the Minnesota Pharmaceutical Association joining in the case as an intervenor, presented extensive testimony by medical authorities, including a number of Mayo Clinic specialists, on the deleterious effects of the ingredients contained in the products involved.

BLUE SHIELD COVERAGE FOR THE AGED PROGRESS NOTED

The nationwide Blue Shield Plans and their sponsoring medical societies have registered outstanding progress in implementing the American Medical Association resolution—passed one year ago calling for development of medical care coverage for the aged by voluntary means, John W. Castellucci, Executive Vice President of the National Association of Blue Shield Plans, said recently in Chicago.

"We have just completed a special survey in order to determine the progress made by Blue Shield Plans since the passage of the AMA resolution last December 4, and the results are most encouraging," Castellucci reported.

"Only eight of the sixty-seven Blue Shield Plans located in the United States, with only two per cent of total Blue Shield membership, have no programs for senior citizens in the works at the present time," he noted.

Castellucci said that the remaining fifty-nine Plans either have special aged programs already being offered in their areas, or have programs in various stages of development.

Specifically, the study conducted by the National Blue Shield Association showed that thirty-two of the Plans, representing more than 50 per cent of total enrollment, have made available nongroup programs for persons over the age of sixty-five. Three Plans, with about 15 per cent of total Blue Shield membership, have programs already approved and ready to be offered as soon as the mechanics of administration are completed. Also, twenty-three additional Plans, covering 30 per cent of total enrollment, have senior citizen programs in various stages of development, and these Plans report that they expect their programs to be in force early in 1960.

Thus, about 98 per cent of the total United States Blue Shield enrollment is in areas where special aged programs are already being offered or are in stages of development, all within a one-year period following passage of the AMA resolution.

Castellucci indicated that in the development of programs for senior citizens, the Plans have followed three general lines of approach: (1) developed new programs designed specifically for persons over sixty-five, (2) effected modifications in existing programs to accommodate enrollees over sixty-five, (3) eliminated age limits on existing non-group programs offered to the general public who are not eligible to join through their place of employment.

Prior to the passage of the AMA resolution, the national Blue Shield organization noted, only a limited number of Plans had special programs for the aged, although all Plans traditionally imposed no age limit on group enrollment and permitted continuation of Blue Shield coverage to all members who had acquired it prior to reaching sixty-five.

"While it is realized that the many and varied problems confronting our senior citizens cannot readily be solved in a short period of time, it is heartwarming to note the significant progress made by Blue Shield Plans throughout the country in the past year in developing programs to meet the special medical needs of persons over sixty-five. In offering these programs Blue Shield, of course, is fully cognizant of the splendid co-operation offered by sponsoring medical societies without whose efforts such significant progress could not have possibly been recorded in twelve short months," Castellucci concluded.

STATUS OF FEDERAL HEALTH LEGISLATION EXPLAINED

A breakfast meeting for legislative key men and women and executive secretaries of the North Central States was held at 7:30 a.m., Sunday, November 22, 1959, at Hotel Leamington, Minne-

apolis, Minnesota, prior to the opening of the North Central Medical Conference.

Principal guest speakers included Ernest B. Howard, M.D., Assistant Executive Vice President, AMA; C. Joseph Stetler, Head of the Law Division and Secretary to the Council on Legislative Activities, AMA; and Leonard W. Larson, M.D., Chairman of the AMA Board of Trustees.

Mr. C. Joseph Stetler, in his address to the group, pointed out what could happen in the Second Session of the 86th Congress with regard to the Forand Bill:

1. The Democrats possibly might adopt the Forand Bill as a party plank. If so, the AMA and the medical profession would lose the support of some of our present Democratic friends.

2. There appears a possibility that the Department of Health, Education and Welfare might soften its position in opposition to the Forand Bill as so firmly and strongly expressed by Mr. Arthur Flemming at the recent Forand Bill hearings. His recently reported comments in the newspapers as to "failure of the administration to come up with an alternative" are disconcerting, to say the least. However, it remains a matter of conjecture as to whether or not Mr. Fleming's remarks were accurately reported, and we are in the process of looking into this matter.

3. The Forand Bill might be amended to hospital "only." This scheme is designed to eliminate physician opposition. It would weaken opposition considerably because people would say "why are the M.D.'s worrying? Their services are not included!" Our opponents hope to deceive those physicians who are not looking ahead as well as deceiving the public and congressmen when it is quite obvious to us that this "hospitalization only" would be just as dangerous as the complete Forand Bill itself as presently constituted.

Congress moves very fast and we have to move fast with it, Mr. Stetler continued. For example, the Forand Bill hearings by the House Ways and Means Committee were called on only ten days' notice. Mr. Stetler commented parenthetically, "and we didn't get any help from the staff of HEW Committee, either." At least twenty-six states by now have had conferences on legislation such as recently conducted by Iowa since the AMA meeting in St. Louis. To the extent they have reached *new* people, they are successful, said Mr. Stetler. Political action at this time is extremely important. Mr. Stetler said we must first of all educate our doctors and the auxiliaries. Next year, when additional hearings on the Forand Bill will undoubtedly be held before the House Ways and Means Committee, the payoff will come. If the doctors are ready then, we hope again to defeat this legislation, but the Congressmen will have to be literally deluged with mail from the local level for success. Mr. Stetler emphasized that the medical profession must widen its influence with other groups for support. Doctor opposition is not enough. He strongly encouraged all physicians to win the support of allies and to become more active at the present time in ascertaining who these allies might be and personally contacting them.

Forand Bill Alternatives

As to alternatives to the Forand Bill, Mr. Stetler asked, are the people who are proposing alternatives talking about (1) legislative alternatives or (2) alternatives for the problems of the aged? Our answer must be there is no legislative alternative for the Forand Bill because government is no answer whatsoever. Private enterprise must be our answer. As to the alternative for the problems of the aged—that is, the real problems—we must strengthen our various private enterprise methods, including specifically voluntary private state and community actions, private insurance and Blue Shield plans. I would add that it might be a good idea to heighten a feeling of family responsibility, perhaps even love and understanding, said Mr. Stetler.

Mr. Stetler emphasized that there are two main points or projects of top priority to be considered by every medical society. These are that (1) each state must analyze its own problems with respect to the real problems of the aged and the political problems, and do something about these problems, and (2) each state must work with *other* groups to be successful in defeating the Forand Bill.

Medical Society Testimony Effective

In closing, Mr. Stetler said he wanted to reiterate that it was the testimony of the twelve state medical societies at the recent hearings on the Forand Bill before the House Ways and Means Committee which had the most effect on the congressmen. The state representatives did a magnificent job and their testimony was presented in a most affirmative and positive manner.

Dr. Ernest B. Howard, Assistant Executive Vice President of the AMA, offered these additional suggestions:

1. Each state must set up a priority of projects and should not "spin its wheels" on a multiplicity of

projects at a time when the defeat of the Forand Bill and political activity by physicians are of paramount importance.

2. Each state should have special congressional district plans for organizing a corps or nucleus of physicians to become extremely active on the Forand Bill and in political and legislative matters. It is impossible, said Dr. Howard, to try and "hit" *every* doctor because every physician will not respond. We must count on a few leaders at the local level.

3. Medical Societies should "go after" leaders of other groups. This is of the highest priority; that is, working with those other groups and obtaining their assistance. Dr. Howard said that such groups as the Farm Bureau and insurance associations, etc., must be approached and activated by leaders in the medical profession. Otherwise, they will remain inactive on the Forand Bill. After all, he said, these groups have many other projects and perhaps to them the Forand Bill might be just one issue out of a hundred on which they are asked to assist. It is, of course, true that state associations of manufacturers, chambers of commerce, and others have been apprised of the Forand Bill by their national groups, but, again, he reiterated that doctors at the state and local level must approach these groups and their state and local leaders if action is to be obtained.

Dr. Howard said that it is also of the highest priority that hospital administrators and trustees be sought out and informed about the Forand Bill, inasmuch as their support is extremely important. "I would suggest that even the hospital auxiliaries be contacted," said Dr. Howard. "Again, I say to you that the support of the hospitals is of the highest priority, particularly if the Forand Bill is amended to 'hospitalization only' next year as is most likely."

Forand Bill Fails to Solve Problems of Aged

Dr. Howard referred to a resolution recently approved by both the American Hospital Association and the American Medical Association and which is to be publicized within the near future. The gist of this resolution is that the Forand Bill does not solve the problem of the *needy* aged and that the community approach to the problem is the more satisfactory answer.

Dr. Howard also gave the group advance notice that the Health Information Foundation, in February of 1960, will issue a report on a scientific sampling or polling of some 1,750 persons, age sixty-five or over, which will clearly corroborate the fact that most of our senior citizens do not need Forand-type legislation. This report to be entitled, "Health Care of the Aged," will literally tear the ground right out from under Mr. Forand's claims that persons of sixty-five or over on a blanket basis are in need of such legislation as he has proposed. Dr. Howard emphasized that physician political action committees are most sorely needed in all states, and it is his hope that every state medical society will encourage the formation of such committees. He reminded those present that such committees should work on the issues rather than on the basis of partisan politics in their support or non-support of candidates.

Referring to the question of a legislative alternative for the Forand Bill, Dr. Howard states strongly that socialistic legislation and government alternatives to private enterprise have already carried us far down the road. He said that at least part of the answer of finding a real rather than a legislative alternative solution to the Forand Bill is to halt inflation. Inflation has destroyed in no small measure the value of the dollar and the resources of the aged.

CIVIL DEFENSE NEWS

(Continued from Page 140)

NOW, THEREFORE BE IT RESOLVED: That the House of Delegates of the Minnesota State Medical Association authorizes and directs the Civil Defense and Civilian Disaster Committee to designate appropriate training programs, and

FURTHER BE IT RESOLVED: That training be accomplished by each county medical society in co-operation with the Civil Defense Area Medical Chief.

Resolution Number 2

WHEREAS, under the Civil Defense Survival Plan established under the authority of the Minnesota Civil Defense Act of 1951, there are five Mobile Support Areas (MSA) and certain target area commands established, and

WHEREAS, the Command Area Medical Chiefs control and co-ordinate the medical care, medical supply, and public health activities in their respective command areas, but the actual performance of these activities is the responsibility of the constituent counties and their municipalities,

NOW, THEREFORE BE IT RESOLVED: That the Minnesota State Medical Association directs that the Command Area Medical Chiefs:

1. Be interested in and with the assistance of deputies, be able to devote the necessary time to Civil Defense and Civilian Disaster.
2. Have the assurance that all members of each county medical society will co-operate to the end that an efficient organization and a sound medical plan, consistent with the State Survival Plan and to include training of lay and professional persons, is developed.
3. Be authorized to establish and maintain, in the interest of Civil Defense and Civilian Disaster, direct contact with the county medical societies in his command area.
4. Have the benefit of a committee of one or more members from each county medical society responsible for Civil Defense and Civilian Disaster.

FURTHER, BE IT RESOLVED: That the Civil Defense and Civilian Disaster Committee of the Minnesota State Medical Association be delegated the responsibility to implement this resolution, and to report annually to the House of Delegates.

Medical Legal Opinion

● *The purpose of this section entitled Medical Legal Opinion is to publish news of recent litigation concerning medical practice as well as to cite past actions and opinions of the Court in medical legal matters as a means of refreshing our knowledge of such procedures.*

Minnesota Laws on Practice of Medicine

SUPREME COURT DECISION ON THE PRACTICE OF MEDICINE

As far back as 1905, the Supreme Court of Minnesota in reviewing a conviction for practicing medicine without a license, referred to the examination of patients as a component part of the practice of medicine. In that case the defendant had been convicted in the District Court at Duluth, Minnesota. On appeal to the Supreme Court of Minnesota, the Supreme Court in affirming the conviction stated: "The question fairly presented to this court for decision is, then, whether the statutory offense consisted merely of prescribing drugs for a fee or of practicing medicine without a license. The act is a beneficial one, and is entitled to a reasonable construction. Its purpose was not, as the counsel for the defendant insists, to merely make prescribing for a fee the offense; so that the defendant could have practiced medicine generally, could have held himself out to the world as a physican and surgeon, *could have examined patients,* and inferentially could have operated upon them as a surgeon for pay, and yet would not have been guilty of a misdemeanor within the meaning of the act. On the contrary, its plain object was to prevent the public wrong of practicing medicine without a license.

(State of Minnesota vs. Oredson—decided Dec 22, 1905—96 Minn. 509—105 NW. Rep. 188)

Again, squarely on the subject of diagnosis, the Supreme Court of Minnesota in 1918 in upholding the conviction of a person for practicing medicine without a license stated: "The science of diagnosing human diseases and human ailments has come to be a distinct branch or department of the medical profession; the diagnostician limiting his efforts to a discovery of the disease or ailment from which a patient may be suffering, its character and location, leaving the treatment thereof to some other physician or surgeon. This is a matter of common knowledge. And it requires no discussion or argument to demonstrate that the physician who thus applies his learning and energies is performing a highly important duty of the profession, and is engaged in the practice thereof, though he prescribes no drug and administers no specific treatment. If a physician so limiting his services is practicing medicine, of which there can be no doubt, then in the case at bar the question whether defendant, in diagnosing the ailment of the person named in the indictment, was likewise engaged was at least a question for the jury. The evidence supports the verdict.

(State of Minnesota vs. Rolph—decided May 17, 1918—140 Minn. 190—167 NW. Rep. 553)

This entire matter was again before the Supreme Court of Minnesota in 1933 in a case from Minneapolis in which the Supreme Court declared illegal a contract between a layman and a licensed doctor of medicine, a pathologist, in which contract the pathologist agreed to furnish the results of urinalyses made for subscribers of a so-called health audit service. In that case the plaintiff brought suit to enjoin the members of the Minnesota State Board of Medical Examiners from interfering with a contract which the plaintiff had with the pathologist. For a fee of $10 per year per person the plaintiff agreed to furnish his subscribers with four urinalyses and a blood pressure test each year. The urine samples were then turned over to the pathologist for examination and report back to the plaintiff. If the analysis showed serious abnormal conditions the plaintiff advised the subscriber to consult with a physician; if the abnormality was slight, the plaintiff advised the subscriber as to proper diet, habits, and exercise, if the report of the pathologist so advised. The plaintiff denied that he was engaged in the practice of healing or medicine. The Supreme Court of Minnesota stated:

"In our opinion, advising the subscribers for a fee as to certain improved habits of diet, exercise, or living, although not accompanied by any medical prescription or treatment, is a violation of section 5717 (Medical Practice Act)."

The Supreme Court further said:

"If Dr. ———— was practicing medicine in what he did and in determining for the planitiff whether the condition of the urine was normal or abnormal, then,

in our opinion, the plaintiff was practicing medicine when he passed on to his subscribers the result of the analysis and the advice of the pathologist. It was as much practicing medicine for the plaintiff to engage Dr. ———— to do this for him as it would have been if had attempted himself to perform these analyses, as he in fact did in the case of the blood pressure tests. To pass on to his subscribers advice as to whether or not the test indicated a normal or abnormal condition, and whether or not the subscriber should consult his physician or be content with the advice which the plaintiff might give in regard to diet, exercise or mode of living, was practicing medicine."

The Supreme Court further stated:

"What the law intends is that the patient shall be the patient of the licensed physician not of a corporation or layman. The obligations and duties of the physician demand no less. There is no place for a middleman."

(Sec. 159.18 Minnesota Statutes)

The Supreme Court emphasized that the Minnesota Basic Science Law included "the diagnosis or analysis of the condition of human health" as being a part of the practice of healing. The Court also held that the contract between the plaintiff and the pathologist was illegal, stating:

"It follows that the contract between the plaintiff and Dr. ———— was in furtherance of plaintiff's violation of these statutes. It was illegal, against public policy and void, and no injunction will lie to prevent interference therewith."

(Granger vs. Adson, et al. decided November 3, 1933—250 NW. 722)

In recent years, the most outstanding case in this field of physician-hospital relations is found in the District Court of the State of Iowa at Des Moines, Iowa. In that case, some thirty-four Iowa hospitals and the Iowa Hospital Association brought a lawsuit against the Iowa State Board of Medical Examiners, the Iowa Association of Pathologists and the Attorney General of Iowa, with the Iowa State Medical Society as an Intervenor in the Lawsuit, "for favorable declaratory relief on the following major issue: whether or not the Plaintiff hospitals are engaged in the illegal corporate practice of medicine in purveying to patients in said hospitals medical services in the form of laboratory procedures and x-ray procedures for compensation." The case was a test case and hundreds of pages of testimony were taken. In fact, the Court heard the case from May 19, 1955, through June 28, 1955, and then again from September 15, 1955, through October 25, 1955, a total of approximately twelve weeks. Arguments of legal counsel were heard by the Court on November 2, 1955, and printed briefs were filed by the parties.

The Court made twenty-two findings of fact and among them, the following:

" 5. The Court finds that pathology and radiology are recognized specialties in the practice of medicine.

"11. The Court further finds that laboratory medicine and radiology in their several branches are indispensable to attending physicians in modern medical care, and that facilities must be available in or near hospitals, and that the ownership and maintenance of laboratory facilities is an integral part of a modern hospital.

"13. The Court finds that when these services are not under actual physician control and supervision, the quality of the services may suffer."

In its conclusions of law, the Court among many others, stated:

"If plaintiffs' contention is right then all institutions included in the definition of 'hospital' set out in Section 135B.1 would have a right to operate pathology and x-ray laboratories and perhaps practice other specialties in the field of medicine."

The Court further stated:

"Most of the reasons given in the decisions condemning corporate practice generally are applicable to the non-profit corporations."

The Court further stated:

"It is the conclusion of the Court that plaintiffs are not entitled to operate pathology and x-ray laboratories merely because they have done so for many years, nor has the Court the right to indulge in judicial legislation."

"It is the conclusion of the Court that under the facts established in this case and the law as the Court understands it, that the work done by the pathologist, radiologist, and the technicians working in the pathology and x-ray laboratories, constitute the practice of medicine."

"That plaintiff hospitals are not excluded from the requirements of the Iowa practice acts in regard to the practice of medicine on the basis that they are non-profit corporations or because of long standing custom and inactivity on the part of those charged with enforcing the law, or because of public policy in the absence of legislative enactment."

"That plaintiff hospitals under the Court's findings of fact and conclusions of law have been engaged in the unauthorized, unlicensed and illegal practice of medicine."

"That under the Court's findings of fact and conclusions of law the pathologists and radiologists have been violating the provisions of Subsection 4 of Section 147.56." (Fee splitting).

Following the above trial, pathology and radiology services in hospitals were transferred from Blue Cross contracts to Blue Shield contracts in the state of Iowa (See pages 506-507, MINNESOTA MEDICINE, July, 1958).

LAST CALL FOR EDITORS OF MINNESOTA MEDICINE

If you have a yen to contribute time, effort and thought to the advancement and communication of medical science, you may do so by volunteering your services. The location of interested physicians is important at this time. Contact the Editor and join while the reorganization program is in progress.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

HELP FOR THE ALCOHOLIC —A PROGRESS REPORT

Have you ever thought of your medical society as an extension of your own practice? By sparking civic action, societies can often organize services individual doctors are too busy to give their patients.

The PR Doctor reports the following successful endeavors which could be adapted locally by county medical societies with similar results. The Genesee County (Flint, Michigan) Medical Society, tired of seeing alcoholic patients through the D.T.s only to watch them go right back to the bottle, decided a follow-up service for chronic drinkers was badly needed. So the society's committee on alcoholism got together with a citizens committee and drew up a plan for providing *group therapy to alcoholics as a local hospital service.* State funds were obtained to match hospital funds, a social worker hired, and the Hurley Hospital Department of Group Therapy was established.

Meetings were held twice a day and two nights a week. *All patients admitted to the hospital for alcoholism are required to attend.* Others are referred by doctors or are former hospital patients. Families of drinkers are also uged to attend.

The clinic doesn't try to provide individual counseling, although an afternoon discussion period does give patients a chance to talk about their problems. Primarily the lectures give patients an idea of what alcoholism is and what they face in rehabilitating themselves. Patients are steered toward such groups as Alcoholics Anonymous for fellowship and individualized help.

Living and working with an alcoholic can be a problem in itself. To help families, friends and employers of drinkers form proper attitudes and keep their own peace of mind, the Genesee County Society has published a booklet called "A Happy Solution to the Problem of Alcoholism." The booklet sets down practical pointers on how and how not to treat the alcoholic. It reassures its readers that "if you are serene and hopeful, if you accept the drinking as a symptom, if you keep faith with the drinker's true self . . . if you let him alone to find his own way to recovery . . . if you are ready with information on where to get help when he asks for it, you are doing your part."

COUNTY FAIR HEALTH EXHIBITS ARE ATTENTION GETTERS

County fairs provide an excellent opportunity for medical societies to do an effective job of public health education with a minimum amount of expense. Many county medical groups throughout the United States have found that an attractive display at a county fair receives considerable attention. This is also a project which appeals to members of county medical auxiliaries.

A new catalog of exhibits available through the American Medical Association includes a selection of available exhibits on various medical and health subjects. The catalog has been designed with the idea that it can be kept current with the addition or deletion of exhibit specification sheets as new displays are completed and as older exhibits are discarded.

The exhibits of the Association are designed for viewing by either professional or lay audiences. The suggested audience for each exhibit is indicated on the exhibit specification sheets.

These exhibits are provided to medical societies on a no-charge basis. However, the borrowing organization is asked to pay freight charges both to and from our warehouse in Chicago. Requests from other groups should be made through a state

or county medical society. The approximate cost of shipping an exhibit can be determined by noting the weight listed in the catalog and then contacting a local trucking firm, prefarably one with a direct line to and from Chicago. All shipments from the AMA exhibit warehouse are made prepaid.

The following suggestions are given to expedite your requests for these exhibits:

1. Requests for use of exhibits should be made as far in advance as possible.
2. Requests should be made on the order form enclosed in the catalog, and should be authorized by the secretary or president of a state or county medical society.
3. All requests should be addressed to: American Medical Association, Communications Division, Exhibit Section, 535 North Dearborn Street, Chicago 10, Illinois.
4. Railway Express may be employed when there is a very limited amount of time for shipment; however, this method of transportation is considerably more expensive than motor freight.

Your state association will cooperate in helping interested groups to place orders for these exhibits. A large selection of public health education printed material is also available through the state office for distribution with these exhibits.

FREE PUBLIC HEALTH EDUCATION LITERATURE AVAILABLE

Americans are a reading public. Why not use this opportunity to make informative public health education materials available to your patients in the waiting room? A few of the many AMA booklets and printed health aids prepared by the AMA include:

The Forand Bill . . . and What You Should Know About It
Personal Health Cards
The Healthy Way to . . . Weigh Less
To All My Patients
Do You Like to Make Decisions?
Plastic Film—Correct Use and Mis-Use—Helpful Hints to Parents
The Merchants of Menace
The Fifth Freedom Guarantees You the Physician of Your Choice!
Stay Young—Think Young
Your Family Health Record
Youth is a State of Mind
What's Up With Our Medical Schools?
The Pill That Could Change America—An Up-to-date Review of Socialized Medicine in the World Today (single copies for waiting rooms only).

The materials will be sent to you in quantity without charge. Mail your order to the Minnesota State Medical Association, 496 Lowry Medical Arts Building, St. Paul 2, Minnesota. Sample copies will be sent upon request.

WHAT IS "BEST MEDICAL CARE"?

According to Dr. Malcolm S. Watts of San Francisco, the best medical care embodies the essential elements of medical practice. These include the need of an individual patient for help with a particular problem, the motivation of the physician and his concern with the individual patient, the secure belief of the patient that the physician can and will help, and the tool or technology by which the help is given.

It considers the economic, social and political predicament of the patient in terms of his need for medical care. It insures that the doctor's primary allegiance remains to the patient and that it is not unduly diluted by financial or other responsibilities to collective groups within or without the profession. It provides for freedom of action for both doctor and patient, before and after illness strikes, in order that the patient may derive the physiological benefit and psychological comfort of faith in his medical care. It requires the economic, social and technological availability of competent physicians, ancillary personnel, and adequate facilities for service.

The best medical care must always be vital, dynamic, changing, growing—in response to the American urge for improvements in standard of living.

Most Americans will pay more for better cars, better housing, better food, or better clothing. They can and will pay more for better medical care if they understand its costs and are convinced of its benefits.

Minnesota Medical Services, Inc. (Blue Shield)

Dr. Richard R. Cranmer, Minneapolis, Acting Executive Director of Minnesota Medical Service Inc. (Blue Shield) since the death of Dr. Edwin J. Simons, has been named Executive Director according to an announcement by Dr. C. A. McKinlay, President. The appointment took place at the meeting of the Board of Directors in Minneapolis, December 30, 1959.

Following the Blue Cross action terminating its working agreement with Blue Shield, Dr. Cranmer has directed the program the centralizing all services and operations within the Blue Shield organization.

With Dr. O. I. Sohlberg, a member of the Minnesota Blue Shield Board of Directors since 1947 Dr. Cranmer has among the earliest advocates of a voluntary, prepayment medical care plan in Minnesota.

Speaking of his association with Dr. Sohlberg Dr. Cranmer remarked: "For years I believed mine was a lone voice in urging the development of such a plan. Then, about 1944, I unexpectedly discovered I had a staunch ally in Dr. Sohlberg." Unknown to each other, the two physicians had been working toward the same goal. Dr. Sohlberg carrying on his activities in St. Paul, Dr. Cranmer in Minneapolis.

In 1944. at the annual meeting of the State Medical Association held in Rochester, Dr. Cranmer introduced to the House of Delegates the first motion calling for the establishment of a Blue Shield Plan in Minnesota. It was unanimouslv passed.

Leadership provided by Drs. Cranmer and Sohlberg played a major role in the movement which finally resulted in passage of the 1945 enabling act authorizing organization of a voluntary prepayment plan to cover medical services.

Dr. Cranmer has held a succession of important posts in the Blue Shield Plan since its beginning in Minnesota. From 1950 to 1952, he served on the Executive Committee of the Associated Blue Shield Plans, a national body made up of representatives of state organizations. He was Vice President of the Minnesota Blue Shield Board from 1947 to 1955 and President from 1956 to 1959 when he assumed the post of Acting Executive Director. During the years 1948 to 1949, he served on the Board of the Blue Cross hospital plan.

Speaking of the continuing Blue Shield program Dr. Cranmer stated:

"Through the new Division of Enrollment and Service, Blue Shield will be in direct contact with subscribers. Representatives of the division, living in the communities where they serve, will enable us to establish closer liaison with participating doctors, as well as subscribers."

"As always," he continued, "the Blue Shield organization will maintain a close relationship with county medical societies and other professional groups throughout the State. It is hoped that expanded personnel will permit the executive staff to devote even more time to this vitally important function."

In January, Dr. Cranmer reported, the St. Louis Ramsey, Washington and Clay-Becker county medical societies adopted resolutions endorsing Blue Shield's program of extending benefits to cover more medical services rendered by doctors. "These expressions of confidence are further evidence that the addition of coverage for diagnostic x-ray and laboratory services was a wise and welcome decision," he said.

Dr. Cranmer also stated that one of his first actions when the current reorganization is completed will be to recommend consideration of increases in certain areas of the Blue Shield Fee Schedule.

Commenting on the recent separation from Blue Cross, Dr. Cranmer said:

"The present turning point came as the result of Blue Shield's refusal to compromise the highest principles of the medical profession and because of the desire to bring greater benefits to subscribers. Surely, the determination to follow such a course can only lead to the fuller realization of Blue Shield's goals."

Meetings and Announcements

INTERNATIONAL

Sixth International Congress on Diseases of the Chest, American College of Chest Physicians, Council on International Affairs, Vienna, Austria—August 28-September 1, 1960.

International College of Surgeons, Twelfth Biennial International Congress, Rome, Italy, May 15-18, 1960.

Fourth International Goiter Conference, July 5-9, 1960, London, England, under the auspices of the London Thyroid Club and the American Goiter Association. Application blanks are available from John C. McClintock, M.D., 149½ Washington Avenue, Albany 10, New York, U.S.A.

Pan American Medical Association Congress, Mexico City, Mexico, May 2-11, 1960. For further information, write Dr. Joseph J. Eller, Director General, 745 Fifth Avenue, New York, New York.

International Congress of Gastroenterology, sixth meeting, Leyden, Netherlands, April 20-24, 1960. Patron: His Royal Highness the Prince of the Netherlands.

Third International Congress of Physical Medicine, Washington, D. C., August 21-26, 1960.

Second International Symposium on Changing Concepts in Medicine (Congenital Heart Disease), Bellevue-Stratford Hotel, Philadelphia, Pennsylvania, April 28, 29, 30, 1960. For further information write Doctor Charles P. Bailey, The Deborah Hospital, Browns Mills, New Jersey, or Doctor Charles P. Bailey, Deborah National Office, 901 Walnut Street, Philadelphia 7, Pennsylvania.

American Institute of Ultrasonics in Medicine, Second International Conference, Statler-Hilton Hotel, Washington, D.C., August 20, 1960.

NATIONAL

American College of Chest Physicians, Twenty-sixth Annual Meeting, Miami Beach, Florida, June 8-12, 1960.

American College of Chest Physicians Council on Postgraduate Medical Education, Thirteenth Annual Postgraduate Course, Diseases of the Chest, Sheraton Hotel, Philadelphia, Pennsylvania, March 14-18, 1960.

Hawaii Medical Association, 104th Annual Meeting, Honolulu, Hawaii, May 12-15, 1960.

District of Columbia Dental Society, Twenty-eighth Annual Postgraduate Clinic, Shoreham Hotel, Washington, D. C., March 13-16, 1960. For further information write District of Columbia Dental Society, 1835 Eye Street, N.W., Washington 6, D. C.

Third Annual Oklahoma Colloquy on Advances in Medicine, University of Oklahoma Medical Center, Oklahoma City, March 24-26, 1960.

New Orleans Graduate Medical Assembly, Twenty-third Annual Meeting, Roosevelt Hotel, New Orleans, Louisiana, March 7-10, 1960. For further information write Secretary, Room 103, 1430 Tulane Avenue, New Orleans 12, Louisiana.

Chicago Committee on Trauma of the American College of Surgeons. Fourth Post-Graduate Course on Fractures and Other Trauma, April 27 through April 30, 1960, John B. Murphy Memorial Auditorium, 50 East Erie Street, Chicago, Illinois.

The Biophysical Society, Fourth Annual Meeting, Sheraton Hotel, Philadelphia, Pennsylvania, February 24-26, 1960. For further information write to H. P. Schwan, Chairman, Local Arrangements, University of Pennsylvania, Philadelphia 4, Pennsylvania, or to O. H. Schmitt, Chairman, Program Committee, University of Minnesota, Minneapolis 14, Minnesota.

American College of Allergists Graduate Instructional Course and Annual Congress, The Americana Hotel, Bal Harbour, Miami Beach, Florida, February 28-March 4, 1960. For further information, write John D. Gillaspie, M.D., Treasurer, 2049 Broadway, Boulder, Colorado.

The Twenty-third Annual Meeting of the New Orleans Graduate Medical Assembly, headquarters at the Roosevelt Hotel, New Orleans, Louisiana, March 7, 8, 9, and 10, 1960.

The Eleventh Annual Symposium on Recent Advances in the Study of Venereal Diseases, Palmer House, Chicago, Illinois, April 7 and 8, 1960.

University of Colorado Medical Center, Postgraduate Courses; General Practice Review (Sixth Annual), January 10-16, 1960; Physical Medicine and Rehabilitation in Neuromuscular and Medical Conditions, June 1-3, 1960; Conference on Research in Emphysema (Aspen, Colorado), June 17-19, 1960; and Clinical Hematology, June 20-25, 1960 (tentative).

Annual Meeting of the American Society of Psychosomatic Dentistry and Medicine, Shoreham Hotel, Washington, D. C., March 11-13, 1960. For further information, write Dr. Jesse Caden, Chairman Program Committee, 5213 Connecticut Avenue, Washington 15, D. C.

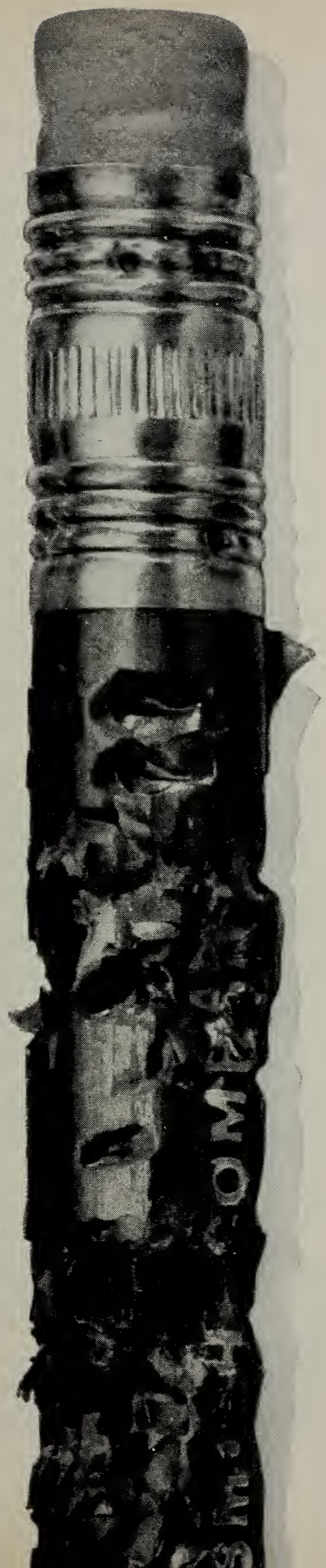
American College of Surgeons 46th Annual Clinical Congress: October 10-14, 1960, in San Francisco, California. For information write: Dr. William E. Adams, Secretary, American College of Surgeons, 40 East Erie Street, Chicago 11, Illinois.

STATE

MINNESOTA STATE MEDICAL ASSOCIATION. 107th Annual Meeting, Rochester, Minnesota, Mayo Civic Auditorium, May 23, 24, and 25, 1960.

Medical Continuation Courses to be presented at the Center for Continuation Study, University of Minnesota: February 29-March 2, 1960, Pediatrics for General Physicians; March 14-16, 1960, Internal Medicine for Internists; March 19, 1960, Trauma for General Physicians; March 28-April 1, 1960, Endocrinology for

(Continued on Page A-60)



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Clinical reports on Dartal: 1. Edisen, C. B., and Samuels, A. S.: A.M.A. Arch. Neurol. & Psychiat. *80*:481 (Oct.) 1958. 2. Ferrand, P. T.: Minnesota Med. *41*:853 (Dec.) 1958. 3. Mathews, F. P.: Am. J. Psychiat. *114*:1034 (May) 1958.

SEARLE

STATE

(Continued from Page 150)

General Physicians; April 7-9, 1960, Emergency Surgery for Surgeons; April 11-13, 1960, Radiology for General Physicians; and April 21-23, Otolaryngology for General Physicians. For further information write, Director, Department of Continuation Medical Education, 1342 Mayo Memorial, University of Minnesota, Minneapolis 14, Minnesota.

HEALTH SCHOLARSHIPS ANNOUNCED FOR 1960

The National Foundation Health Scholarship Program is offering 103 health scholarships for four years of study at fully-accredited schools of medicine. To be eligible, a student must be currently enrolled as an undergraduate at an accredited college and must be accepted for admission to medical school for the fall of 1960 by the applications deadline of April 1, 1960. The only obligation of Health Scholarship winners is to have the intention of completing their education and of serving the health field as a member of their chosen profession.

Purpose.—Health scholarships are four-year college scholarships. They pay $500 a year, or a total of $2,000. Each is to help a student prepare for a career as a nurse, an occupational therapist, a physical therapist, a medical social worker, or a doctor. A minimum of 515 health scholarships are offered annually.

Availability.—To be eligible, an applicant must be a citizen of the United States and: (a) a graduating high-school senior interested in a career in *nursing, occupational therapy* or *physical therapy;* or (b) a college sophomore aiming for a career in *medical social work;* or (c) a college undergraduate accepted for admission to an approved school of *medicine.*

In 1960, awards will be made only to students who have been accepted for admission to an accredited college or university for the academic year 1960-61. Students may file applications for scholarships pending acceptance for admission to an accredited school.

Winners are selected on the basis of academic record, personal qualifications, professional promise and financial need, as shown in the application blank and other credentials submitted by or on behalf of each applicant. Winners of these awards are announced during the summer.

Renewal.—Health scholarships are renewed annually for no more than three additional years, or for a total of four consecutive years, provided the student is in good standing and is following the educational program approved.

Use of Funds: Health scholarship funds may be used for any educational expense. Students may accept scholarships from other sources, but are expected to inform The National Foundation of the source and amount of other awards.

(Continued on Page A-64)

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HEALTH SCHOLARSHIPS

(Continued from Page A-60)

Application blanks and detailed information are available from: (a) the head (or guidance or scholarship official) of your high school or college; (b) your local chapter of The National Foundation or (c) The National Foundation Health Scholarships, 800 Second Avenue, New York 17, New York.

Completed scholarship application and all other required credentials must reach The National Foundation Health Scholarships Office by April 1, 1960.

BLOOD BANK TRAINING COURSES

Classes for laboratory personnel in theory and procedures for blood banking will be given again this year by the Minnesota Civil Defense and Disaster Blood Program. Four different dates have been selected for the five-day courses which will be given at the Minneapolis War Memorial Blood Bank, Minneapolis, on April 18, June 27, September 12, and December 5.

The course will include discussions of human red cell antigens, the Rh-Hr system, problems in establishing an emergency donor system, sources of error and use of controls, and techniques for collecting blood from donors. During the five days, students will also have an opportunity to observe the interview and examination of donors, prepare the arm for phlebotomy, and gain a working knowledge of the physical equipment used in bleeding donors.

This training is considered invaluable in the event of man-made or natural disaster when considerable amounts of whole blood are needed, as well as in more normal periods because of the frequent use now made of blood banks.

Each of the courses will be limited to eight students. Tuition for the course is $40.00, half of which will be paid by the Office of Civilian and Defense Mobilization. Additional information and application blanks can be obtained from Mrs. Helen Arndt, M.T. (ASCP), Minneapolis War Memorial Blood Bank, 2304 Park Avenue, Minneapolis.

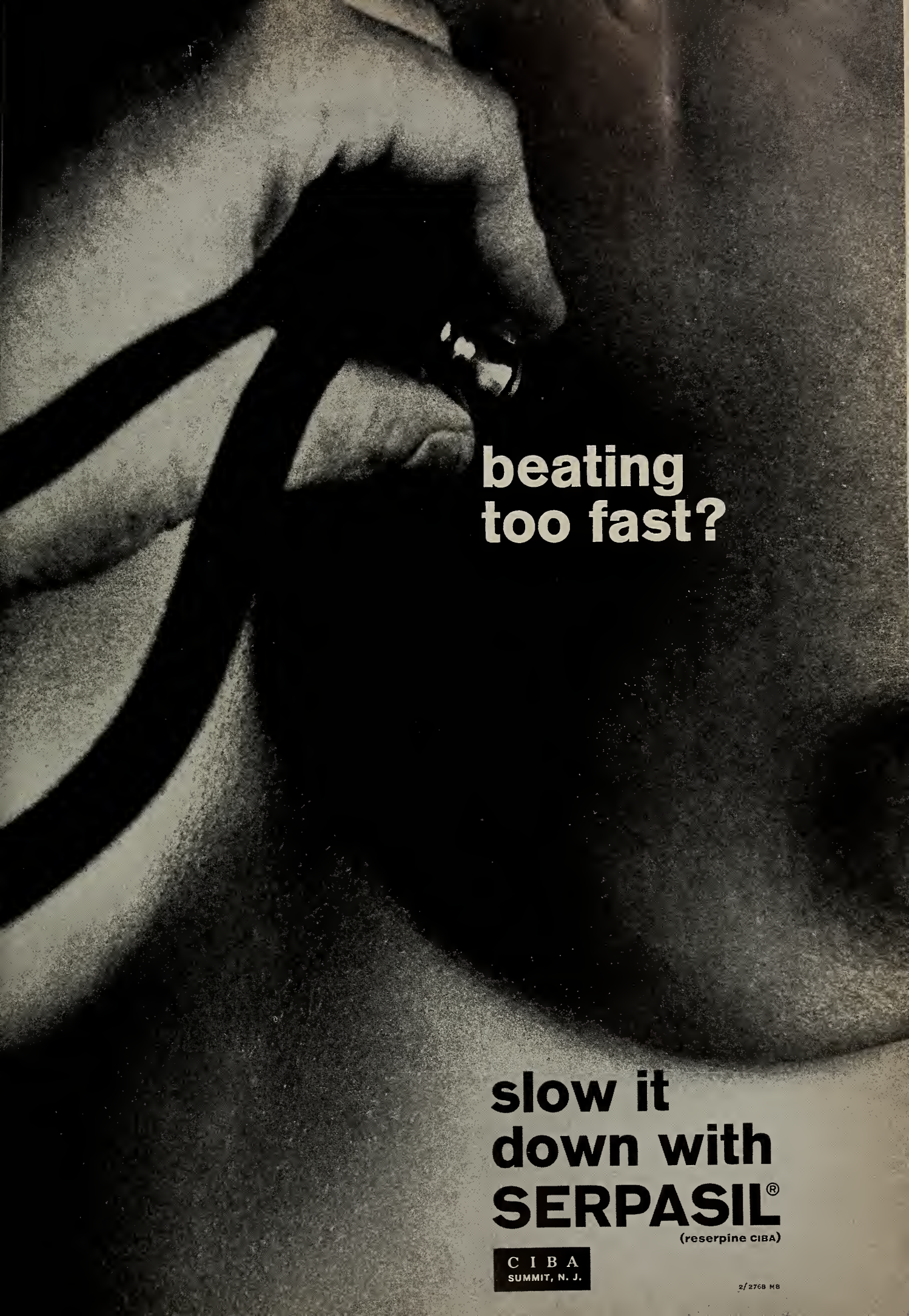
MAYO CLINICAL REVIEWS ANNOUNCED

Staff members of the Mayo Clinic and the Mayo Foundation for Medical Education and Research will present a three-day program of lectures and discussions on problems of current interest in general medicine and surgery, April 4, 5, and 6, 1960.

The American Academy of General Practice and the College of General Practice of Canada have informed the Committee on Clinical Reviews that up to twenty-one hours of Category I credit may be obtained by members of the American Academy of General Practice or the College of General Practice of Canada attending.

There are no fees for this program.

The number of physicians who can be accommodated is necessarily limited. Those wishing to attend should communicate with the Clinical Reviews Committee, Mayo Clinic, Rochester, Minnesota.


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Woman's Auxiliary

RAMSEY COUNTY REPORTS JANUARY ACTIVITIES

The Ramsey County Auxiliary held its Board meeting on January 11, 1960, after the holiday recess. Mrs. Hanns Schwyzer, President, called the meeting to order. Plans were formulated for the informal dinner dance which was given for members and their husbands at the Town and County Club. Mrs. Rodney Sturley and other members of the committee are to be congratulated on their efforts in making the evening a pleasant one.

Mrs. John R. Meade, Health Council Representative, attended a recent meeting of the Council. Red Cross activities, including the blood donor system, were explained to the members. Auxiliary members have chosen the blood bank project as the principal project of the year.

Mrs. William F. Menold and Mrs. Frank Ubel have represented the Auxiliary at Inter-Club Council meetings. In this way, the Ramsey County Auxiliary maintains a close contact with the work of other civic organizations in St. Paul.

Mrs. Wallace Gleason, Mrs. Harold O. Peterson and Mrs. Earl Wetzel are busy contacting public and private schools to give information concerning the Association of American Physicians and Surgeons' Essay Contest.

STATE AUXILIARY PARTICIPATES IN ANNUAL TUBERCULOSIS SPEAKING PROJECT

Ten Minnesota Junior and Senior high school students won awards in the twenty-ninth annual Christmas radio speaking project aimed at informing teenagers of today's tuberculosis problems and ways of preventing the disease.

Trophies were presented by the Woman's Auxiliary to the Minnesota State Medical Association, which co-sponsored the project with the Minnesota Tuberculosis and Health Association and WCCO radio.

Winners, who broadcast their scripts over WCCO December 13 and 20, are as follows:

Junior High Students—Janet Huibregtse, South Junior high school, Hopkins, first; Helen Cuddy, Our Lady of Good Counsel Academy, Mankato, second; Cynthia Reardon, Visitation Convent, St. Paul, and Susan Zeiher, St. Mary's School, Morris, runners-up.

Senior High Students—Margo Meyer, St. Felix high school, Wabasha, first; Stanley Spangenberg, Fairmont

(Continued on Page A-72)



as it calms anxiety!

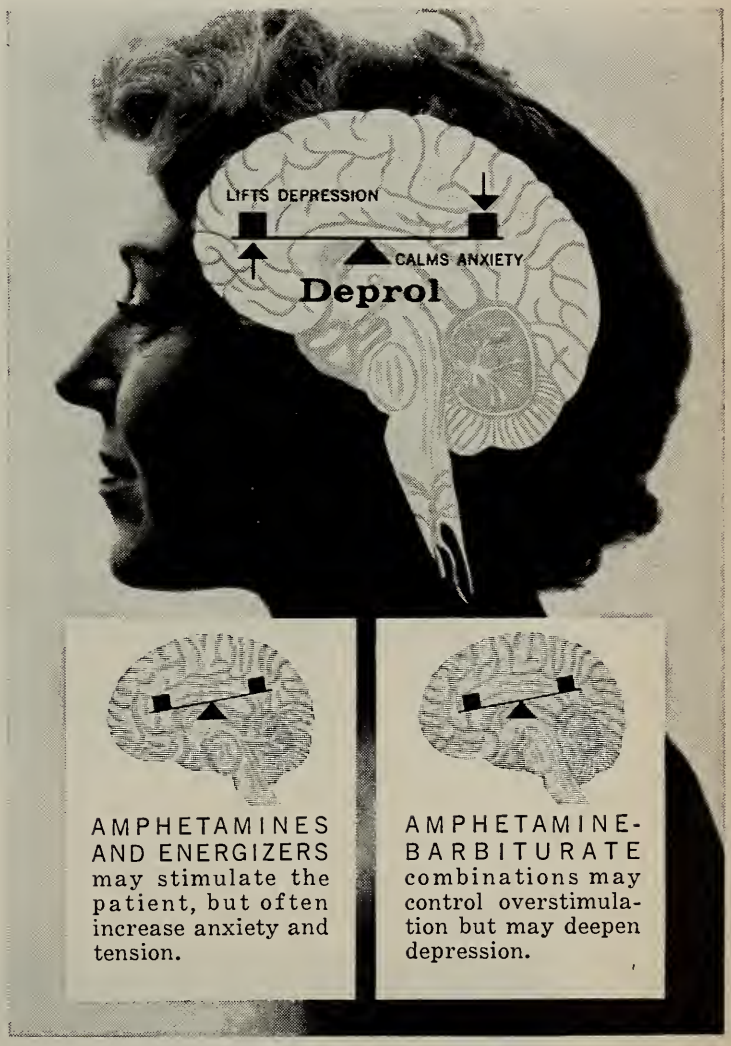
Smooth, balanced action lifts depression as it calms anxiety... swiftly and safely

Balances the mood – no "seesaw" effect of amphetamine-barbiturates and energizers. While amphetamines and energizers may stimulate the patient – *they often aggravate anxiety and tension.* And although amphetamine-barbiturate combinations may counteract excessive stimulation – *they often deepen depression.*

In contrast to such "seesaw" effects, Deprol lifts depression as it calms anxiety – both at the same time.

Acts swiftly – the patient often feels better within a few days. Unlike the delayed action of other drugs which may take two to six weeks to bring results, Deprol's smooth, immediate action relieves the patient quickly – often within a few days.

Acts safely – no danger of liver damage. Deprol does not produce liver damage, hypotension, psychotic reactions or changes in sexual function – frequently reported with other drugs.



BIBLIOGRAPHY *(10 clinical studies, 714 patients):*

1. Alexander, L. (35 patients): Chemotherapy of depression – Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Bateman, J. C. and Carlton, H. M. (50 patients): Meprobamate and benactyzine hydrochloride (Deprol) as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy 6:648, Nov. 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulito, F. (77 patients): Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** Breitner, C. (31 patients): On mental depressions. Dis. Nerv. System 20:142, (Section Two), May 1959. **5.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresia, G. B. (128 patients): Treatment of depression—New technics and therapy. Am. Pract. & Digest Treat. 10:1525, Sept. 1959. **6.** Pennington, V. M. (135 patients): Meprobamate-benactyzine (Deprol) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **7.** Rickels, K. and Ewing, J. H. (35 patients): Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **8.** Ruchwarger, A. (87 patients): Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **9.** Settel, E. (52 patients): Treatment of depression in the elderly with a meprobamate-benactyzine hydrochloride combination. Antibiotic Med. & Clin. Therapy. In press, 1959. **10.** Splitter, S. R. (84 patients): The care of the anxious and the depressed. Submitted for publication, 1959.

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STATE AUXILIARY PARTICIPATES IN ANNUAL TUBERCULOSIS SPEAKING PROJECT

(Continued from Page A-68)

high school, Fairmont, second; Jeannine Jansen, Father Pierz Memorial high school, Pierz; and Cindy Ivins, Priscilla Lovestedt and Kathleen Rowland, all of John Marshall high school, Rochester, runners-up.

Honorable mention was given the following:

Senior High Students—Nicole Rath, Karon Schmitt and Rita Mattingly, Our Lady of Good Counsel Academy, Mankato; Rita Hollerman, St. Benedict's high school, St. Joseph; Beverly Rossini, St. Agnes high school, St. Paul; Fidelia Nilles, Mount St. Benedict Academy, Crookston; Kathy Peterson, Blooming Prairie high school, Blooming Prairie; Joyce Swanke, Olivia high school, Olivia; Linda Sandberg, Alango high school, Angora; and Edwina Grajeck and Gretchen Schneider, Convent of the Visitation, St. Paul.

Junior High Students—Linda Whitney and Darlene Worlie, Roosevelt Junior high school, St. Paul; Margie Kippley, St. Mary's School, Worthington; Mary Knutson, Convent of the Visitation, St. Paul; Kathryn Koehl, Stevens School, Hancock; and Ellen Becker, St. Michael's School, Mahnomen.

MARITAL STATUS OF GRADUATING MEDICAL STUDENTS

Preliminary evidence, based on a questionnaire survey of the financial problems of medical students addressed to members of the graduating class of 1959, shows that the family composition of medical school graduates has changed over the last few years. To date, information has been tabulated for 4,400 male students, of whom 2,284 were married. Comparisons have been made with a survey conducted by the National Opinion Research Center on a small sample of the graduating class of 1956. This study of 1959 graduates shows 63 per cent married, versus 55 per cent in the 1956 N.O.R.C. study, and of the married students 24 per cent had two or more children in contrast with 12 per cent of the earlier study. (Seven per cent of the 1959 class reported having three or more children. One graduating senior reported having seven!)

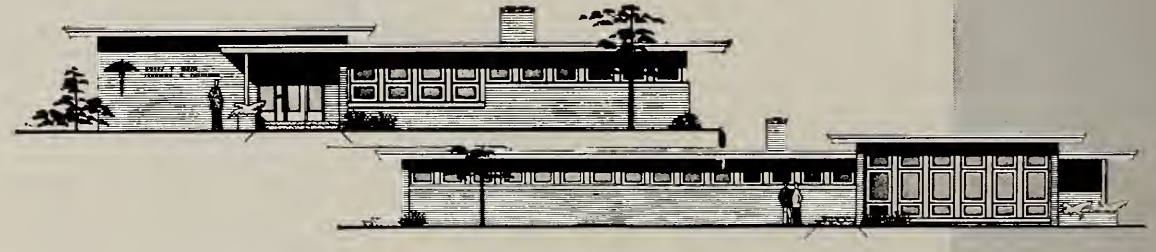
Information obtained from 232 female medical students in the class of 1959 shows that 58 per cent were single and 40 per cent were married. Thirty-three per cent of the married women had one or more children.

KNOWLEDGE AND WISDOM

The fault of the quiz programs was not so much that some of them were "rigged" but that they helped perpetuate a false idea of what knowledge and education are.

Dag Hammarskjold said recently that in modern times we are in danger of taking facts for knowledge, and knowledge for wisdom.—Michael Reck, *New York Times.*

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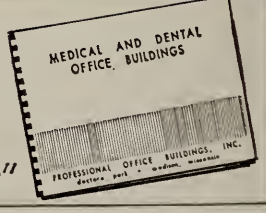
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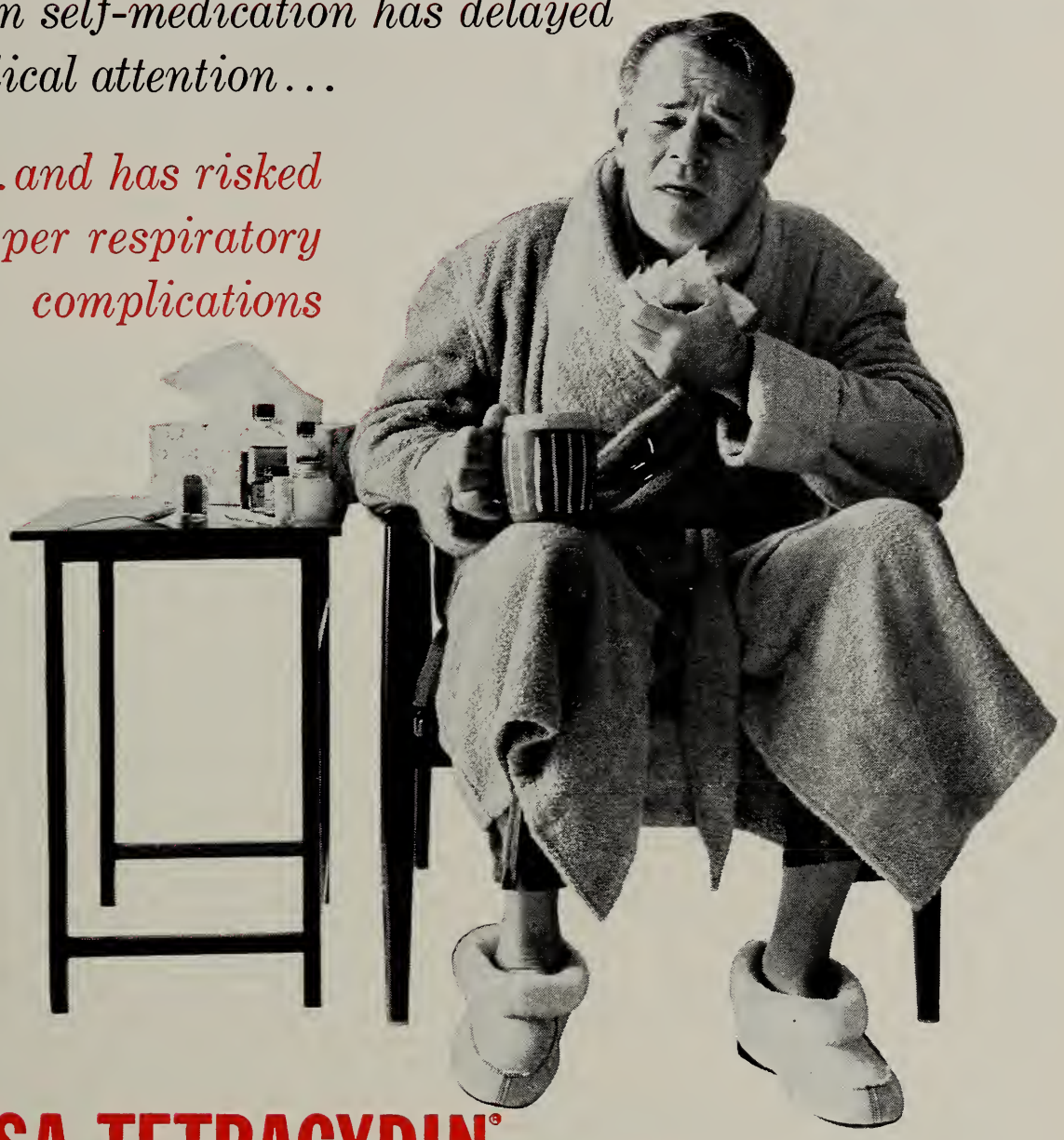
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Communications

FOREIGN FELLOWSHIPS FOR MEDICAL STUDENTS

A program to further international relations for the United States by making it possible for medical students to serve as unofficial ambassadors, has been announced by the Association of American Medical Colleges and Smith Kline & French Pharmaceutical Company.

Established by a $180,000 grant from Smith Kline & French, the new program will provide foreign fellowships through which students of United States medical colleges may travel abroad for a limited period of time to work in remote areas of the world.

These fellowships will provide selected medical students with broad clinical experience, an understanding of preventive medicine as practiced abroad, an opportunity to study diseases not common to the United States and a definite awareness of the acute need for American physicians and their medical knowledge abroad. In addition, this opportunity will afford the selected Fellow the chance to play the role of individual ambassador or missionary. He will be representative of the method of medical education in the United States today while communicating the most recent information available on medical science to distant areas of the world.

Any student who has completed his third year of medical school is eligible to apply for a fellowship. If accepted, he may spend twelve weeks or more at a foreign mission or other remote private medical facility, or a public health unit, clinic or hospital.

The award of a fellowship will be determined on the basis of the applicant's ability, potential and his objectives in wanting to study abroad. Emphasis will be placed on the applicant's plan for study and experiences which would not be afforded to the applicant at a medical school here in the United States and through which the student will bring back significant knowledge to the United States.

Cash awards will be made on an individual basis. A contribution to the expenses of the wife or husband accompanying the Fellow will be made when this seems desirable in terms of the objectives of the program and of the Fellowship. No awards will be made for the expense of children.

At the termination of time spent abroad, a Fellow is expected to write a report summarizing his clinical experiences abroad, including his personal evaluation of the effectiveness of the trip as a part of his medical education.

Medical students who wish to apply for a fellowship must submit their application to the dean of their medical school. If the application is acceptable, the dean will then endorse it and forward it to the Selection Committee at the Association of American Medical Colleges.

INFLUENZA EPIDEMICS

Outbreaks of influenza-like disease have been officially reported in fourteen States and the District of Columbia, according to a report by Surgeon General Leroy E. Burney of the Public Health Service.

In seven States and the District of Columbia, laboratory tests have identified the disease to be the A-2 or Asian strain. Isolations have not been completed in the remaining seven States.

No estimate can be made at this time of the numbers of persons stricken on a nationwide basis, Dr. Burney said. Reports from State Health Officers, however, indicate that the extent varies from small groups such as university students to widespread areas such as sections of entire cities.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

States reporting isolation of the Asian strain are California, Hawaii, Iowa, Michigan, Pennsylvania, Texas, Washington and the District of Columbia. In addition, reports of influenza-like disease outbreaks have been received from Kentucky, Mississippi, Nevada, Ohio, Tennessee, Utah, and West Virginia.

Upwards of 500,000 cases have been reported in Los Angeles where the absenteeism rate from school and work is estimated at about 15 per cent. Eight isolations have been made of the Asian strain. All hospital beds in Fresno were reported filled last week and isolation of the Asian strain has been made there. Merced County has reported about 4,000 cases, with a school and work absentee rate of 15 per cent. Outbreaks also have occurred in Santa Barbara, Sacramento and Tulare County.

Outbreaks are appearing throughout Texas, with current concentrations in San Antonio, Corpus Christi, Austin, Brownsville and Houston. The Brownsville schools report that thirty-five per cent of the student body has been absent.

Nearly 30 per cent of the school and industrial population of Detroit was on the absentee list early this week. Outbreaks also are reported in the Michigan cities of Ann Arbor, Flint and Saginaw.

The largest outbreak in Pennsylvania is centered in Pittsburgh.

The Surgeon General forecast outbreaks in more areas of the country during the next several weeks. Many of these, he said, will probably start in concentrated populations such as schools and factories and spread to communities. Characteristics of the outbreaks thus far do not indicate that an epidemic of the 1957 proportions will occur this year. A large number of individuals, however, can be expected to contract influenza before the season is over. For the majority of individuals, the disease will be quite uncomfortable with fever and generalized aching, but with improvement within a week. For a small proportion of persons, the symptoms may become more severe and not improve rapidly. For these individuals it is especially important that a physician be consulted to be certain that no complications develop.

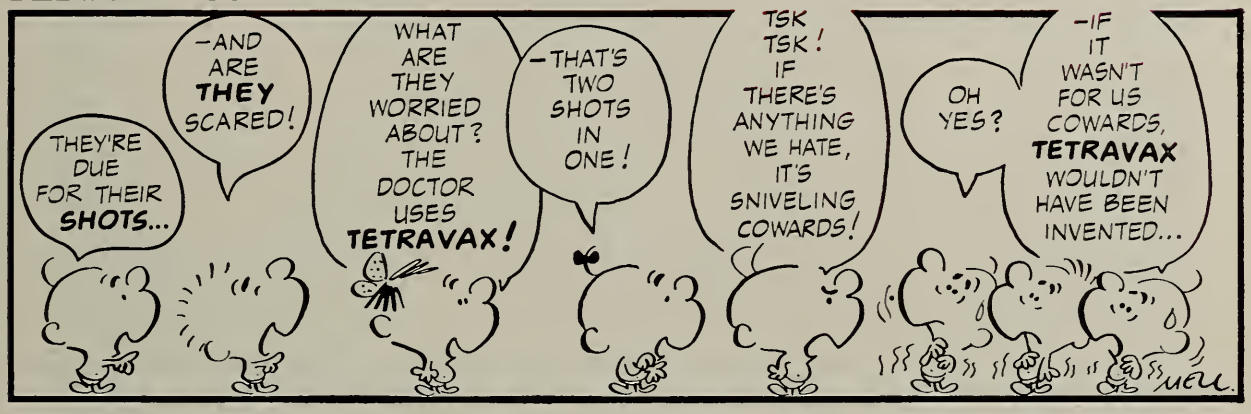
Reports of deaths from influenza and pneumonia have shown an increase above normal in the past two weeks particularly in Los Angeles, San Antonio, Detroit and Pittsburgh.

The Surgeon General repeated his advice of October 29 that vaccination against influenza is especially desirable for persons in whom the disease would be an added health risk such as individuals with heart or lung disease, pregnant women, and persons over fifty-five years of age with any form of chronic disease. He pointed out, however, that since it takes three weeks following vaccination to develop protection against the disease, it may be too late in many areas to expect vaccination to have a beneficial effect.

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In Memoriam

WALTER BAER

Dr. Walter Baer, a Saint Paul physician, died January 16, 1960, of a heart attack. He was sixty-one years of age at the time of his death.

A victim of persecution by both the German Nazis and the Chinese Communists, Doctor Baer began his practice in Saint Paul nine years ago.

Born in Germany, he graduated in 1921 from the University of Dusseldorf Medical School. He became an instructor at the University Medical School following graduation. He fled his homeland in 1940 under pressure and practiced medicine for ten years in Shanghai. In 1950, he was again forced to leave, this time under the pressure from the Communists.

After studying eight months in New York for a license, he became an intern at Miller Hospital in Saint Paul at the age of fifty-two and began practice after completion of his certificate to practice in the State of Minnesota.

Doctor Baer was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Ilse; a daughter, Margaret, and a sister, Mrs. Annie Hearst, London, England.

RALPH E. BILLINGS

Dr. Ralph E. Billings, a physician in Franklin, Minnesota, for more than thirty years, died December 19, 1959. He was sixty-nine years of age at the time of his death.

The deceased was born in Jasper, South Dakota, and was graduated from the University of Minnesota Medical School. He was a World War I veteran and was a former Chairman of the Franklin School Board, Past President of the Renville-Redwood County Medical Society, a member of the Minnesota State Medical Association and the American Medical Association.

In addition, Doctor Billings was a member of the American Legion and Saint Luke's Lutheran Church in Franklin.

Survivors include his wife; three daughters, Janet, Mrs. George (Marsha) Noulies of New Orleans, and Mrs. Ronald (Doris) Van Victor of Los Angeles; six sisters and one brother.

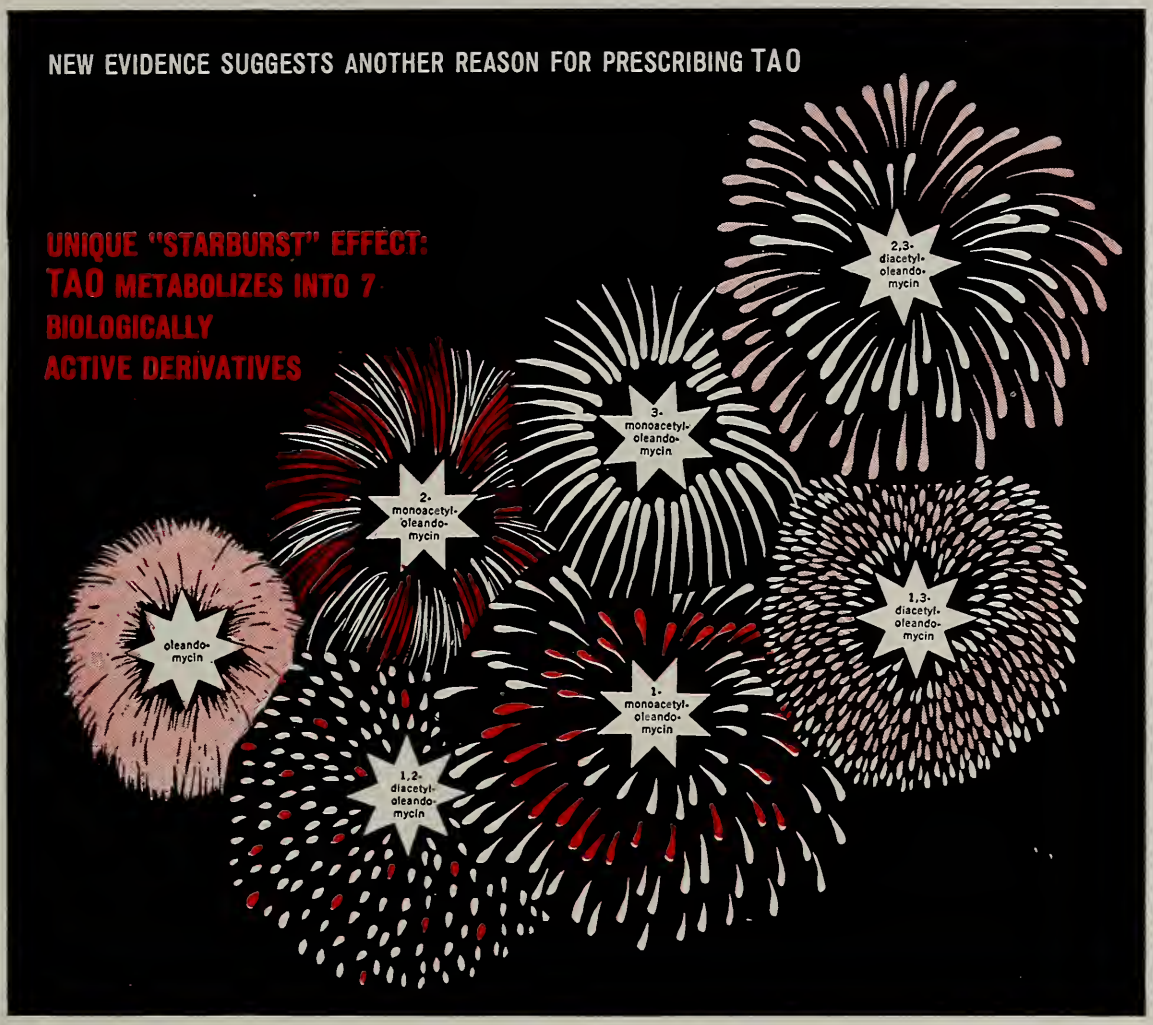
LAURENCE H. CADY

Dr. Laurence H. Cady, Minneapolis physician, died December 18, 1959. He was sixty-eight years of age at the time of his death.

The deceased was a member of the Hennepin County

(Continued on Page A-78)





The impression that TAO is an unusually active antibiotic has steadily gained recognition by impressive clinical performance. Now come reports of **in vivo** and **in vitro** biological and biochemical evaluations that show TAO to be indeed unique.[1,2]

TAO differs from other antibiotics in that it is metabolized to multiple active compounds which **remain** active throughout their presence in the body. These 7 derivatives (in addition to TAO) show activity against common Gram-positive pathogens, including resistant strains of **Staph. aureus.**

In light of these findings, take another look at TAO performance: • 92% success in published cases of Gram-positive respiratory, skin, soft tissue and genitourinary infection • Effective against 78% of 64 "antibiotic-resistant" epidemic staphylococci. (In the same study, chloramphenicol was active against 52%; erythromycin against only 25%)[3] • No side effects in 94%; infrequent reactions mild and easily reversed • Quickly absorbed • Highly palatable.

Sound reasons to: Start with TAO to end 9 out of 10 common Gram-positive infections.

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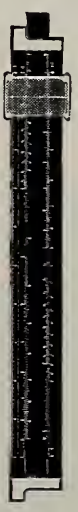
Other TAO forms available: TAO Pediatric Drops: flavorful, easy to administer. **TAO®-AC:** TAO analgesic, antihistaminic compound. **TAOMID®:** TAO with triple sulfas. **Intramuscular or Intravenous:** in clinical emergencies. Prescription only.

1. English, A. R., and McBride, T. J.: Proc. Soc. Exper. Biol. & Med. 100:880 (Apr.) 1959. 2. Celmer, W. D.: Antibiotics Annual 1958-1959, New York, Medical Encyclopedia, Inc., 1959, p. 277. 3. English, A. R., and Fink, F. C.: Antibiotics & Chemother. 8:420 (Aug.) 1958.

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LAURENCE H. CADY

(Continued from Page A-76)

Medical Society, the Minnesota State Medical Association and the American Medical Association.

In addition, he was a member of the Saint Anthony Commercial Club and a Past Master of University Masonic Lodge 316.

Doctor Cady was on the staff of Saint Andrew's Hospital in Minneapolis.

The deceased was born in Minneapolis and received his preliminary education at Minneapolis East High School and the University of Minnesota. His medical education was obtained at the University of Minnesota Medical School.

Survivors include his wife, Esther, and three sons, Patrick, Timothy and Michael.

PAUL J. PRESTON

Dr. Paul J. Preston, former Chief of Staff at Asbury Hospital in Minneapolis, died December 29, 1959, at the age of seventy years.

The deceased was a graduate of the University of Minnesota and the University of Chicago Medical School. He was also on the staff of the new Methodist Hospital in St. Louis Park.

For twenty years, Doctor Preston had served as team physician for the Minneapolis Millers. In April of 1959, he was presented with a lifetime American Association pass by the League President.

He was a member of Hobart Methodist Church, Masons and Shriners, the American Legion and Disabled American Veterans. Doctor Preston was Past Commander of the Fifth District American Legion.

The deceased was an Associate Member of the Minnesota State Medical Association, the Hennepin County Medical Society and the American Medical Association.

Survivors include his wife, Marie; a son, James R., and a daughter, Mrs. David Hatlestad, all of Minneapolis and a sister, Mrs. E. O. Sandbo, Stanford, Montana.

RUSSELL M. WILDER

Dr. Russell M. Wilder, emeritus member of the Mayo Clinic staff and world-famed expert on diabetes and medical nutrition, died December 16, 1959. He was seventy-four years of age at the time of his death.

The deceased was born in Cincinnati, Ohio, and received his preliminary education at South Side Academy in Chicago, Illinois. His medical education was received at Rush Medical College located in Chicago, Illinois.

In 1914, Doctor Wilder studied in Vienna for eight months, principally at the First Medical Clinic.

He had been commissioned a First Lieutenant in the Medical Reserve Corps of the Army in 1914. On June 12, 1917, he was ordered to active service at Fort Benjamin, Harrison, Indiana. He went to France in

January, 1918, as a Captain, and Chief of the Medical Service of Evacuation Hospital Number Two. He later served on the headquarter's staff as Chief of War-gas Defense (medical) of the Second Field Army. He left the Army on June 4, 1919.

Doctor Wilder entered the Mayo Clinic, October 1, 1919, as an Associate in the Division of Medicine and Assistant Professor of Medicine in the Mayo Foundation.

On May 15, 1929, Doctor Wilder left Rochester to become Professor of Medicine and Chairman of the Department of Medicine in the University of Chicago. He worked there on osteitis fibrosis cystica and on obesity, Addison's disease and epilepsy.

He returned to the Clinic October 1, 1931, and became Professor and Head of the Department of Medicine at the Mayo Foundation. In this same year, he was appointed a member of the Council on Foods and Nutrition of the American Medical Association.

He became a Senior Consultant in the Division of Medicine of the Mayo Clinic on July 1, 1946. He retired from the Mayo Clinic and Mayo Foundation on December 31, 1950, and became Director of the National Institute of Arthritis and Metabolic Diseases, U. S. Public Health Service, at Bethesda, Maryland, in January 1951. He relinquished the post because of ill health and returned to Rochester in July 1953.

He was President of the American Diabetes Association in 1946-47, and was elected President of the National Vitamin Foundation in 1956. He was a Fellow of the American Medical Association and of the American College of Physicians, and a member of the Association of American Physicians, the American Society for Clinical Investigation, the American Physiological Society, the American Society for Experimental Pathology, the American Institute of Nutrition, the Central Society for Clinical Research, the Central Interurban Clinical Club, the Minnesota Society of Internal Medicine, the Institute of Medicine of Chicago, the Academies of Medicine of Minnesota and Washington, D. C., the Alumni Association of the Mayo Foundation, Society of the Sigma Xi, Alpha Omega Alpha, Nu Sigma Nu and Delta Kappa Epsilon.

Doctor Wilder was made a Master of the American College of Physicians in 1957; The American Diabetes Association conferred the Banting Medal upon him in 1947, and the University of Chicago gave him the Distinguished Service Medal in 1941 and the Howard Taylor Ricketts award in 1949. The Medical Alumni Association of the University of Chicago presented him with the honorary gold key in 1955. The American Medical Association honored him with the Joseph Goldberger award in 1954 and in 1956 the American Bakers' Association gave him an award in recognition of activities in promoting enrichment with vitamins of white flour and bread.

Survivors include his wife; two sons, Dr. Russell M. Wilder, Jr., Topeka, Kansas, and Dr. Thomas C. Wilder, Spokane, Washington.

Doctor Wilder was an Associate Member of the Minnesota State Medical Association, the Zumbro Valley Medical Society and the American Medical Association.



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The Physician's Diary

Tracy physician, **Dr. W. G. Workman**, gave an impromptu address at a recent Kiwanis Club, when he spoke on the important work of the public health service. He pointed out how the government's health department is like a watchdog to safeguard the public from uses of food, medicines and numerous products until proven safe.

* * *

It was learned recently that **Dr. Albert J. Lenarz**, Browerville, has moved to St. Cloud, Minnesota. Doctor Lenarz will be associated with **Dr. J. B. Gaida** in the practice of medicine.

* * *

Dr. John S. Lundy, former member and emeritus founder and head of the Section of Anesthesiology of the Mayo Clinic, has been appointed Associate Professor of Surgery in the Northwestern University Medical School in Chicago. The appointment will be effective until October 31, 1964.

* * *

The Immanuel Hospital medical staff of Mankato at its recent annual meeting elected as President of staff **Dr. F. D. Roth**, who will serve through 1960. Other officers elected were: **Dr. J. C. Wohlrabe**, Mankato, Vice President, and **Dr. H. J. Smith**, Lake Crystal, Secretary. Elected to the Executive Committee were **Dr. D. B. Swenson** and **Dr. J. C. Von Drasek.**

* * *

Dr. Frances E. Schaar, Minneapolis, recently attended the annual meeting of the American Society of Hematology held in St. Louis, Missouri.

* * *

Dr. A. G. Athens, Duluth, a member of the St. Louis County Medical Society since 1922, recently retired from practice.

* * *

At a recent staff meeting of the Divine Infant Hospital in Wakefield, Michigan, **Drs. E. E. Barrett, Wm. B. Martin** and **J. F. Schmid**, Duluth, presented papers on rheumatic fever, differential diagnosis of chest pain and common dermatoses, respectively.

* * *

A member of the Grand Rapids Clinic, **Dr. Calvin J. Johnson**, has been inducted as a new Fellow in the American College of Surgeons.

* * *

The first medical research grant in the history of the Minnesota Medical Foundation was awarded recently. The grant, for $13,716, went to **Dr. Frederick C. Goetz**, of the Department of Medicine, University of Minnesota Medical School, to finance a two-year research project aimed at developing substitutes for insulin in the treatment of diabetes. A team of scientists and technicians will participate.

* * *

Dr. H. J. Svien, Mayo Clinic neurosurgeon, has been appointed North American Vice President of the Section of Neurosurgery of the Pan American Medical Association.

* * *

Dr. Charles P. Floyd has recently joined the staff of Willmar State Hospital. Doctor Floyd is a graduate of the University of Michigan School of Medicine, and interned at St. Joseph's Hospital in Denver, Colorado. He is a native of Estancia, New Mexico.

* * *

A Mayo Clinic staff member, **Dr. Robert R. Kierland**, has been re-elected Secretary-Treasurer of the American Academy of Dermatology and Syphilology.

* * *

Dr. Maynard Cohen, University of Minnesota neurologist, has been awarded a grant of $14,171 by the National Multiple Sclerosis Society, it was announced recently. The grant was made for one year's research into multiple sclerosis.

* * *

The American Academy of Dermatology and Syphilology recently elected **Dr. Francis W. Lynch**, St. Paul, as President at the group's eighteenth annual meeting in Chicago. Doctor Lynch succeeds Dr. Anthony C. Cipollaro, Professor and Director of the Department of Dermatology and Syphilology at the New York Poly-Clinic Medical School and Hospital in New York City.

* * *

Waseca, Minnesota, has a new physician. **Dr. Thomas Rohrer**, a native of Waterville, has begun general practice in the First National Bank Building. Doctor Rohrer is a graduate of the Waterville High School and of the University of Minnesota Medical School. He served his internship in Sacramento, California.

* * *

Dr. R. T. Healy, Pierz, was recently honored at a surprise dinner party in honor of his fifty years of medical practice.

* * *

A Mayo Clinic staff member, **Dr. J. Arnold Bargen**, has been appointed a member of the Executive Committee of the Mississippi Valley Medical Society, according to Dr. Harold Swanberg, Quincy, Illinois, Secretary-Treasurer of the organization. Doctor Bargen previously had been elected to the Board of Directors of the Society.

* * *

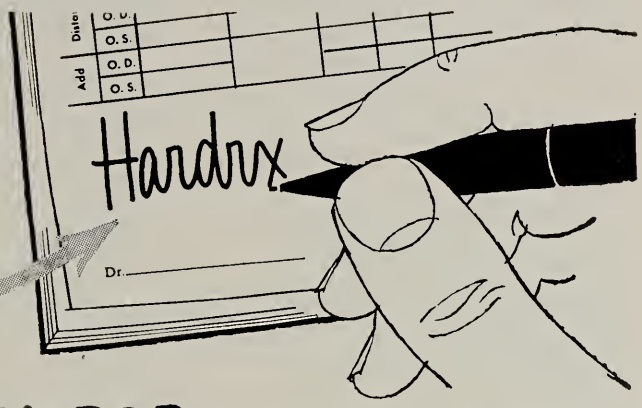
The Fridley Jaycees recently presented a plaque to **Dr. Alan R. Jay**, in recognition of his donation in time and effort to the anti-polio vaccination program. The award was made at a dinner meeting of the Jaycees.

* * *

Six Marshall physicians have just completed moves from rented offices into their own medical buildings. One building, the Marshall Medical Centre, is occupied by **Drs. J. E. Murphy, P. C. Hedenstrom** and **R. W.**

(Continued on Page A-82)

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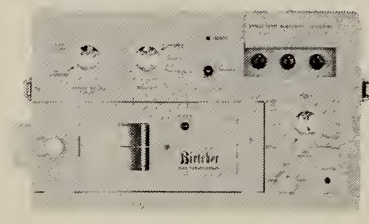
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(Continued from Page A-80)

Taintor. The other, Doctors' Plaza, is occupied by Drs. **K. A. Peterson, J. E. Eckdale,** and **B. C. Ford.** The buildings are two blocks apart on Highway 19, a few blocks east of the business district. The contemporary, prefabricated buildings are air conditioned.

* * *

A seminar for Detroit Lakes area doctors, sponsored by the Heart of Lakes Chapter of the American Academy of General Practitioners and the Eli Lilly Company, was held recently at St. Mary's Hospital, Detroit Lakes. Appearing on the program were **Dr. Frank Quattlebaum,** St. Paul, who spoke on "Sphincter of Oddi—Surgical Problems," and **Dr. Charles Neumeister,** Minneapolis, whose topic was "Common Protological Problems."

* * *

Augsburg College, Minneapolis, has been provided a gift of $2,000 by the **Dr. Silas C. Andersen** Memorial Fund to be used for mathematics and science department equipment. Doctor Andersen was a member of the Hennepin County Medical Society.

* * *

The Mesaba Clinic, Hibbing, recently announced that **Dr. Richard Moyer** has joined the clinic staff specializing in the practice of internal medicine. Doctor Moyer is a graduate of the Syracuse Medical School and completed his internship and special training at the Pennsylvania Hospital of Philadelphia.

* * *

Dr. Jesse E. Edwards, Mayo Foundation professor and consultant to the Mayo Clinic, has been appointed chief pathologist at Miller Hospital, St. Paul. Doctor Edwards will assume his new duties June 1, succeeding **Dr. Kano Ikeda,** who retired after thirty years of service.

* * *

The West Central Medical Society recently elected **Dr. F. D. Bucher,** Starbuck, President, and **Dr. Alan Zempel,** Starbuck, Secretary of the Society. Elections took place at the Society's annual dinner meeting.

* * *

Dr. William L. Furlow, Faribault, was elected Director of the Southern Minnesota Chapter of the Minnesota Academy of General Practice at its annual meeting. Guest speakers at the one-day session included **Drs. Virgil P. Lundquist** and **Earl Wetzel,** both of Minneapolis.

* * *

The new Chief of Staff of Mounds Park Hospital, St. Paul, is **Dr. Walter Gardner** who succeeds **Dr. E. C. Emerson** in that position. Other officers elected were **Dr. John Earl,** Vice Chief of Staff; **Dr. Eva Jane Larson,** Secretary-Treasurer; and **Dr. Herbert Molander** who was elected to the Board to succeed **Dr. R. H. Beech.**

* * *

Dr. John Pone, Cambridge, was recently elected President of the Memorial Hospital medical staff of Cambridge. **Dr. Alvin Berglund,** Cambridge, was elected Secretary.

* * *

The East Range Clinic of Biwabik has announced that **Dr. S. C. Blackmore,** Biwabik, has discontinued active

(Continued on Page A-85)

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(Continued from Page A-82)

practice and will limit practice to industrial injuries. The decision was made because of illness.

* * *

Dr. Edward Detjen, who has moved to Arizona from Bigfork, has been succeeded in the practice of medicine in Bigfork by **Dr. R. J. Lynn.** Doctor Lynn previously practiced medicine in central Nebraska. He is a graduate of the University of Nebraska School of Medicine and interned at St. Joseph's Mercy Hospital in Sioux City.

* * *

Members of the Lake Superior District Accident and Health Underwriters Association recently heard **Dr. Gordon C. MacRae,** Duluth, urge the expansion of rehabilitation services. Doctor MacRae was a guest speaker at a luncheon meeting of the Association.

* * *

Duluth physician, **Dr. John H. Peterson,** is the newly elected President of the St. Louis County Medical Society, succeeding **Dr. Richard Bardon.** Other officers elected include **Dr. Philip N. Bray,** President-Elect for 1961; **Dr. C. H. Christensen,** Vice President; and **Dr. John V. Thomas,** Secretary-Treasurer. **Dr. O. G. McDonald** was named to the Advisory Committee for a three-year term. **Drs. A. J. Bianco, William B. Klein** and **M. O. Wallace** became members of the Advisory Committee to the Minnesota State Medical Association. **Drs. Bianco, J. J. Coll, F. W. Conley** and **J. C. Feuling** were named members of the Nominating Committee. Selected for three-year terms of the Judiciary Committee were **Drs. M. G. Gillespie, K. E. Johnson** and **J. M. Streitz.** Other committee members named were **Drs. C. M. Bagley, C. C. Brown,** and **William D. Rudie** to the Economics Committee and **Drs. Josiah Fuller** and **L. R. Gowan** to the Grievance Committee. **Dr. R. O. Bergan** was named delegate and **Dr. G. F. Nisius,** alternate delegate, for three-year terms.

* * *

The Chisholm office of the Adams Clinic has announced the appointment of **Dr. George J. Barry** to the staff. Doctor Barry is a graduate of St. Thomas College and received his medical degree from Marquette University Medical School. He interned at Letterman Army Hospital in San Francisco.

* * *

Dr. Paul N. Larson, Minneapolis, has been elected Chief of Staff of Northwestern Hospital medical staff. Other officers elected were **Dr. Richard Tudor,** Vice President and **Dr. Mark C. L. Hanson,** re-elected Secretary-Treasurer.

* * *

A new appointment to the Oliver Clinic in Graceville is **Dr. Karl Palmer.** Doctor Palmer, a graduate of the University of Minnesota Medical School, interned at Cleveland, Ohio. He spent one year in postgraduate study at the University of Minnesota before serving in the medical department of the U. S. Air Force.

* * *

Dr. Dale C. Cameron has announced that he has accepted the position of Assistant Medical Superintendent

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of St. Elizabeth's Hospital in Washington, D. C. St. Elizabeth's Hospital is one of the largest mental institutions in the United States.

* * *

The medical staff of St. John's Hospital, St. Paul, has elected **Dr. Robert Emmons** as Chief of the Medical Staff. Also elected to office were **Dr. N. W. Howe**, First Vice Chief of Staff; **Dr. Charles Beck**, Second Vice Chief of Staff and **Dr. Deno Wedes**, Secretary.

* * *

Mayo Clinic staff members attending a recent meeting of the American Academy of Cerebral Palsy held in Los Angeles included **Dr. D. J. Erickson**, **Dr. N. P. Goldstein**, **Dr. E. W. Johnson** and **Dr. R. G. Siekert.**

* * *

Dr. and Mrs. M. J. Schirber of Grand Rapids became the proud parents of their twelfth child (and seventh daughter) on January 8. She has been named Jeanne Therese.

* * *

Dr. and Mrs. Virgil J. Schwartz of Minneapolis, and their daughter, Virginia (Mrs. Verne S. Mattison of Philadelphia), left New York on January 30, 1960, by air for South America. Doctor Schwartz is on the program of the VI Pan-American Congress of Ophthalmology, which convenes every four years—on this occasion at Caracas, Venezuela. Following the meeting they will tour the Caribbean, visiting Curacao, Haiti, Jamaica and Puerto Rico. After this, they plan a week of motoring through Florida, returning to their homes about February 20, 1960.

* * *

Duluth physician, **Dr. Robert O. Bergan**, has been named Duluth Chairman for the fund campaign of the Minnesota Association of Retarded Children. Doctor Bergan stated that there are an estimated 90,000 retarded children in the State.

* * *

The St. Paul Society of Internal Medicine recently elected **Dr. Philip Socheray** of St. Paul as president for 1960. Other officers for the year are **Dr. David Craig**, Vice President and President-Elect; **Dr. Francis Tiffany**, Secretary-Treasurer, and **Dr. Valentine O'Malley** and **Dr. C. N. McCloud**, members of the Executive Committee.

* * *

Dr. Roland F. Neumann, Minneapolis, has been appointed chairman of the Medical Advisory Committee of United Cerebral Palsy of Minnesota. Doctor Neumann is a staff member at University of Minnesota Hospitals and at Gillette State Hospital. As Chairman of the Advisory Committee, Doctor Neumann will promote physician education about cerebral palsy.

* * *

The office quarters of **Drs. Carl Simison** and **W. Jay Janecky** of Barnesville have been enlarged and remodeled. A 24 by 25 foot addition was added to the north side of the building that is owned by Doctor Simison.

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Bibliographical references should appear on a separate sheet entitled References. They should appear and be numbered consecutively in the order in which they first occur in the text (not alphabetically). Citations in the text require reference numbers if the author's or authors' names are not used or if there is more than one reference to the same author or group of authors. All references to author should appear in the list of References and no references should be included which are not in the text. The style and exact punctuation used in the J.A.M.A. references are requested. Journal references should include: *Author's last name, initial., initial.: title of paper. Abbreviated name of journal, volume number: page, year.* Book references should give author, title, edition number, city, publisher and year.

Illustrations (photographs, tables and graphs) should be submitted separately and not combined in the text. There should be a separate sheet entitled "Illustrations" which contains the various types of illustrations listed separately and numbered in the order in which they appear in the text. All photographs must be in black and white, clear cut, contrasting, and on glossy stock. Instructions for combining photographs are acceptable. Any number of illustrations over 4 are charged to the author. Combinations of photographs up to one-half page (6 x 4⅜ inches) count as 1 illustration.

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Animal Diseases Transmissible to Man

Pathogenic microorganisms, in their struggle for survival, adapt to new hosts and changing circumstances. New human-animal disease relationships are being reported with increasing frequency. Here the author discusses the most prevalent zoonoses, the term being applied to infectious diseases which are common to human beings and animals.

ROBERT J. ANDERSON, M.D., M.P.H.
Atlanta, Georgia

Presented at the Annual Meeting of the Minnesota State Medical Association, Duluth, Minn., May 27, 1959.

Dr. Anderson is Assistant Surgeon General, Chief, Communicable Disease Center, Bureau of State Services, Public Health Service, U. S. Department of Health, Education, and Welfare, Atlanta, Georgia.

THE CONNECTION between human and animal health is acquiring greater significance today as new disease entities are found to afflict both man and animals and as previously unsuspected disease relationships become manifest. More than 100 infectious diseases which are common to humans and animals have been listed by the 1959 WHO Expert Committee on Zoonoses—a substantial increase over a few years ago. The importance of these interrelationships is further demonstrated by the increasing frequency with which the phrase "in man and animals" appears in the titles of medical and research papers dealing with a wide variety of diseases.

Recently discovered pathogenic microorganisms, especially viruses, account for many of the newly described disease entities. In 1948, two-thirds of the sixty viruses known to infect man had other animals as primary hosts. Although they involved man secondarily, they often affected him more

severely than they did other species. More recently, some seventy new so-called "human" viruses have been established and studied, including a number of respiratory viruses and enteroviruses of the Coxsackie and ECHO groups. Originally, these viruses were thought to be specific for man, but as experience with them has broadened, a correlation with animals has been found for many of them.

For example, Para influenza 3 virus, which causes a significant amount of upper respiratory illness and pneumonia in children, has been isolated from cattle in association with outbreaks of shipping fever. In Maryland and Pennsylvania, fourteen separate strains of this virus have been recovered from calves, many of which had respiratory disease. In order to determine the human significance of extensive bovine infections with Para influenza 3 virus, we must learn more about the infection and disease in cattle. Looking toward prevention, the National Institute of Allergy and Infectious Disease, in collaboration with the University of Maryland and commercial companies, is investigating the possibility of a vaccine for humans and calves.

Sendai, a new myxovirus isolated in Japan, is sometimes referred to as Influenza D. An important cause of pneumonitis in infants, it has also been recovered in swine and rodents. As a final example, the notorious salivary gland virus family has been found to have related, but species-specific, representatives in mammals other than man.

There is probably no simple answer as to why new human-animal disease relationships are being reported with increasing frequency. Pathogenic microorganisms, in their struggle for survival, adapt to new hosts and changing circumstances. We are becoming more aware of human-animal disease relationships as new and improved diagnostic techniques permit us to identify and associate previously unsuspected animal-disease agents with clinical syndromes in humans. For example, the virus responsible for Newcastle disease, which is a problem in the poultry industry, produces conjunctivitis and systemic effects, including chills, fever, and influenza-like symptoms, in man.

The interactions of host, parasite, and environment are subject to rapid change, as expanding human populations with their billions of domestic animals pre-empt more and more of the earth's surface and introduce great numbers of susceptible hosts to unfamiliar disease agents. Some diseases which were once primarily identified with wildlife have become established in livestock and in pet animals, and through closer contact have become a greater threat to man. Leptospirosis is an excellent example of this. Until twenty years ago, leptospirosis in man (Weil's disease) was identified only with rats. Then Meyer and his colleagues reported that Canicola fever, a new form, was transmitted from dogs. Now the disease is known to affect many kinds of wild and domestic animals, including birds, and it is being diagnosed increasingly often in man.

Some of the more important communicable diseases of man and animals have been controlled to a degree in the United States and in the advanced western nations. In this country, certain animal diseases that affect both the nation's health and its livestock economy have been made the special target of co-operative programs carried out by public health and veterinary regulatory agencies. As a result of these concerted control efforts, bovine tuberculosis is rarely a source of human disease, and the incidence of brucellosis is declining.

Today I would like to discuss a few of the most important diseases that could be eliminated as health hazards to man if we could wipe them out at their animal sources.

None inspires greater dread than rabies; yet, from the standpoint of its incidence in man, this has become a comparatively rare disease, claiming six human lives last year. In the past decade, the number of reported cases in dogs—the chief source of human infection—has been reduced by 75 per cent as a result of extensively applied control measures. Nevertheless, rabies is still of grave concern to the estimated 2½ million individuals who are bitten or scratched by animals each year and to the medical practitioners who must determine how to treat them. It is estimated that approximately 30,000 to 40,000 of these persons are bitten by rabid or suspected rabid animals and must undergo the course of treatment, which is often painful and sometimes hazardous.

Although there has not been a case of human rabies in Minnesota since 1917, last year more than 2,000 persons in Minneapolis and St. Paul and nearly 1,500 persons in other parts of the State were bitten or otherwise exposed by animals. As usual, children were the chief victims. At least 232 of the exposed persons received antirabies vaccination treatment.

There is little excuse for a rabies problem in any

urban community today when it has been shown that rigidly enforced canine immunization laws, control of stray dogs, and public education can eradicate it. The sylvatic reservoir presents a far more difficult problem in control. While the incidence of rabies in dogs has been declining, the number of cases reported in wildlife and livestock species has multiplied.

I understand that Minnesota experienced a record number of animal rabies cases last year, with skunks accounting for more than half of them. Because wildlife rabies, especially in skunks, is increasing in the Midwest, CDC (Communicable Disease Center) recently established a rabies investigation station at Poynette, Wisconsin. Our people are co-operating with the State Department of Health, Livestock Sanitary Board, and Department of Conservation in carrying out an investigative program on your rabies problem.

Since the development of hyperimmune antirabies serum and new types of immunizing agents, treatment for humans has advanced. Hyperimmune serum, administered as soon as possible after exposure, protects the victim during the interval required for antirabies vaccine to take effect.

The possibility of immunizing humans against rabies before exposure has been under investigation for several years. New vaccines produced by passing virus through chick embryos have now been administered experimentally in many parts of the country. Preliminary results, as measured by the antibody response in vaccinated individuals, are encouraging. If these vaccines prove satisfactory, they will be a boon to individuals who run a certain risk of exposure to rabies, for example, veterinarians, dog wardens, postal and delivery men, and laboratory workers.

Q fever is a widespread rickettsial infection of animals that rarely causes recognizable disease in its animal hosts but may produce a variety of symptoms in man. The causative organism, *Coxiella burneti,* is most frequently found in cattle, sheep, and goats, but a number of small mammals, including rodents, and wild and domestic birds have also been described as carriers.

Transmission of Q fever to man usually occurs by direct contact with an infected animal or its environment. In naturally infected livestock, a rickettsial aerosol is liberated during parturition, contaminating the surrounding area. The organism is often found in the milk of infected cattle, but it can be destroyed if the pasteurization temperature is raised one or two degrees above that generally used.

When it is diagnosed in man, Q fever usually manifests itself as an influenza-like syndrome characterized by sudden onset, headache, malaise, and thoracic pain. X-rays of the lungs reveal a patchy infiltration which frequently clears up in a few days. In elderly people, the disease may be generalized and terminate fatally. In many instances, Q fever can be diagnosed only by serological test. As for treatment, the disease in man responds well to the broad spectrum antibiotics.

Control of Q fever is difficult. Vaccination of certain high risk occupational groups, immunization of cattle, and the proper pasteurization of milk and milk products are all considered to be of some value.

The psittacosis-ornithosis reservoir is no longer confined to pet birds; the disease is prevalent in many avian species in this country, especially in domestic poultry. During the past few years, epidemics of human disease became increasingly common among workers on poultry farms and in poultry processing plants from coast to coast. In 1954, a large reservoir of the disease was uncovered in western Wisconsin and eastern Minnesota. At that time, infections were largely subclinical, but were occasionally manifested by transitory respiratory symptoms. The turkey prototype showed low mammalian virulence in the laboratory. Last year, Dr. Rex Graber of the Chippewa Falls, Wisconsin, Health District, and Dr. Benjamin Pomeroy, Professor of Veterinary Bacteriology and Public Health, University of Minnesota, published an epidemiological study of a human outbreak transmitted from turkeys in Wisconsin. The authors believe that the ten human cases they describe are the first to demonstrate that turkey ornithosis strains of low virulence are capable of causing disease in man. Most of the victims were employed in the killing department of a processing plant and were infected through airborne transmission of virus in dust particles and spray aerosols.

As an interesting side note Dr. Pomeroy himself did not get psittacosis until this year, even though he had worked with this highly infectious disease for more than a decade.

The preventive approach to this disease has been through antibiotic regimes incorporated in the daily diet of psittacine birds and poultry.

Brucellosis is a major problem in many parts of the world, but its importance in this country is

diminishing as a result of the bovine control program. As recently as 1947, it was estimated that 20 to 30 per cent of the cattle in this country and 5 to 10 per cent of the swine were infected, and human cases were being diagnosed at a rate of about 10,000 per year. In 1958, as a result of the national campaign, fewer than 800 human cases were reported, mostly among veterinarians, farmers, and workers handling animals and animal products. The incidence among dairy and range cattle has also dropped precipitously. By the end of 1958, sixteen states had been accredited by the national brucellosis control program, which means that less than one per cent of their cattle show a positive serum agglutination. Minnesota is one of these states.

Brucellosis in man responds to the broad spectrum antibiotics, but relapses frequently occur and some individuals develop hypersensitivity to the *Brucella* organisms which persists beyond the acute clinical state.

Another bacterial disease — leptospirosis — is emerging as an important problem. One of the most widespread diseases in nature, it has been found in all kinds of animals, domestic and wild, and even in birds. In man, it is usually an occupational disease but it may be a recreational accident. Infection in man occurs through direct contact with diseased animals or indirectly through contact with water or soil contaminated by the urine of infected animals. The leptospires enter the body usually through the externally accessible mucous membranes or abrasions of the skin.

Symptoms of leptospirosis in man vary. Although they are frequently severe, the mortality rate is low. The disease is manifested by fever, headache, myalgia, and meningitic signs. Jaundice is seldom seen except in severe cases. Recently CDC developed a multiple antigen for serological screening tests, which is now being evaluated in health departments, hospital laboratories, and veterinary diagnostic centers.

Tetracyclines in large doses initiated within three days of onset of the disease in man is relatively effective as a therapeutic procedure, but it has no value if its use is delayed as much as four days.

Control of leptospirosis in animals is most difficult because of the wide range of the organism and its survival in water and soil. Vaccines for man and animals offer the best solution; they are now being developed and field tested.

It would be difficult to overestimate the incidence of enteric disease in man and animals. We know far more about the bacterial agents responsible for gastroenteritis and diarrheal disease than we do about the viral causes, which may be equally important. Among the enteric bacteria common to animals and man, the genus *Salmonella* has universal distribution. It has over 500 antigenic serotypes, all pathogenic for man, animals, or both. Their natural habitat is in the intestinal tract of animals, but organisms have been isolated from a wide variety of situations. Many human outbreaks of salmonellosis have been traced to contaminated eggs, milk, poultry, and meat, just as others have been traced to human carriers.

The ubiquitous nature of the organisms poses many problems. Our most effective means of control is to instigate measures of good sanitation and personal hygiene in food processing plants and in the home. Control in animals is difficult, since many species may become asymptomatic carriers and act as reservoirs of infection to other animals and man. CDC is serving as the National Salmonella Typing Center. Through precise phage typing, it is now possible to trace outbreaks of salmonellosis to their original source.

Anthrax in animals and among rural human populations has declined greatly in this country, although it is a disease that still requires constant vigilance. Most of the human cases of anthrax in the United States in recent years have occurred in industrial workers handling imported contaminated goat hair, wool, hides, and bones.

Soil is a reservoir of anthrax spores for both animals and man. Four cases of anthrax in children in Arkansas last year, and two additional suspected cases, substantiate this fact. In each instance, the children had contact with soil on their premises where livestock had died of anthrax and had been dragged into the fields to be burned. The children had no direct contact with the animals.

There is a possibility that the use of contaminated wool and hair waste from mills as fertilizer may be responsible for introducing anthrax into a non-endemic rural area. Just a few weeks ago, a New Jersey farmer, living reasonably close to some Philadelphia textile mills, contracted cutaneous anthrax after one of his cows died. Several hogs that were fed the intestine of this cow subsequently developed anthrax.

Fortunately, this disease usually yields to penicillin.

The dermatophytes have many links between man and animals. Investigations at CDC have shown that from 70 to 80 per cent of ringworm cases in rural populations and 10 to 30 per cent of the cases in urban populations are of animal origin. Farmers and their families become infected by handling cattle at milking time or contacting the fungus in the barn. Cattle ringworm is a winter disease, and most of the human infections are also. The disease often clears up spontaneously in the cattle and in the people who tend them when warm weather returns and the animals are put out to pasture. Much of the ringworm seen in children is transmitted to them by their pets and even by stray cats and dogs which they handle. Control of these infections in children, therefore, must be based on the elimination of the animal disease. The most promising development in the control of dermatophytes is the success that is being obtained therapeutically in humans and animals with griseofulvin. This remarkable antibiotic, discovered and evaluated in Great Britain, is administered orally. It has proved effective in the treatment of ringworm of the scalp, onychomycosis, tinea corporis, and tinea pedis.

Now, I would like to tell you a little about the fluorescent antibody technique, our most promising new laboratory diagnostic tool for the rapid identification of microbial agents. This procedure was first discovered more than ten years ago by Dr. A. M. Coons and others at the Harvard University School of Medicine, and has been widely used in experimental studies. During the past four years, CDC has explored the procedure for routine public health laboratory use. It has recently had its first successful test in the field.

This field trial, conducted with the co-operation of the Florida State Board of Health, involved 144 cases of suspected rabies in animals. Specimens suspected of containing rabies virus were tested with the technique within a matter of minutes, also put through the standard two-to-three week mouse inoculation test. The results were 100 per cent in agreement. With this test, the need for specific treatment would be evident immediately and could be started without delay.

A field trial, comparable to those on rabies, is now in progress on the diagnosis of streptococcal (beta hemolytic) infection. Specimens will be tested by the conventional method also, which takes at least three days. With the new technique, the test can be done in minutes although usually about three hours is allowed. Rapid identification of beta hemolytic streptococci would permit adequate therapy to be started early enough to prevent rheumatic fever.

Less advanced, but also at a preliminary testing stage, are efforts to adapt the technique in tests for syphilis, gonorrhea, toxoplasmosis, and several other diseases.

In this procedure, an antibody solution of high titer conjugated with fluorescein is employed as an immunochemical stain. This is applied to smears made from clinical specimens. When conjugated antiserum contacts homologous antigen, the fluorescein-antibody is fixed. The unreacted and indifferent fluorescent proteins are then washed away and the smear is examined microscopically. An ordinary microscope, fitted with appropriate filters and with the field illuminated by intense ultraviolet light, reveals the brilliant yellow-green glow from the fixed fluorescent antibody, thus showing the presence and location of the specific organism.

In addition to its speed and simplicity, the new testing method has the advantage of working when only a few organisms are present. The test can also be used with contaminated specimens. Consequently, the test can often be made directly on the specimen, with no intermediate steps, at a tremendous saving of time, staff, and money.

When testing materials and methods are perfected for the various communicable diseases, and when laboratory technicians are trained to use them, the whole system of laboratory procedures for the identification of infectious agents will be revolutionized by the fluorescent antibody technique.

In addition to such research activities, CDC provides epidemiologic services, laboratory diagnostic services, and training to help State and local health departments develop their own programs for the prevention and control of human-animal diseases. Through these agencies the practicing physician has access to highly specialized resources to aid him in safeguarding his patients and his community against infectious diseases. Because the zoonoses present a vast and difficult problem in this country and throughout the world, the Communicable Disease Center has built an extensive program around them.

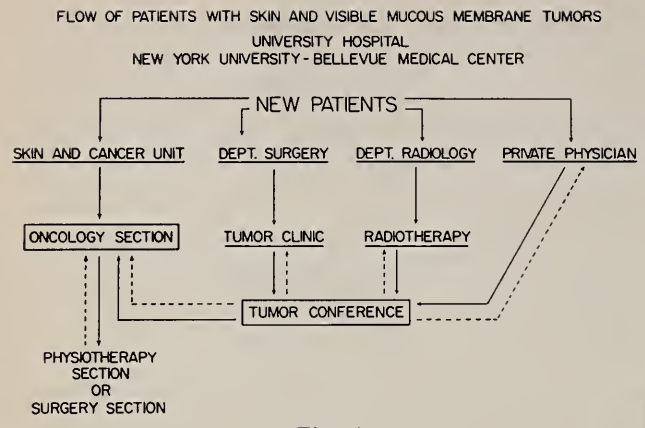


Fig. 1.

Skin Cancer Therapy

Some Dermatological Surgical Aspects

Presented at the Symposium on Skin Cancer for Dermatologists, University of Minnesota, October, 1957.

Skin cancer, the commonest cancer of man, is deserving of more attention not only by the dermatologist, but also by the general practitioner. In this article, basal cell epitheliomas are described most completely because of their frequency. The clinical diagnosis versus the histologic diagnosis is reviewed, and a very good description of the technique of biopsy is presented. The methods of treatment are clearly outlined. The author stresses the fact that the choice of the proper modality requires training and experience.

ALFRED W. KOPF, M.D.
New York, New York

SKIN CANCER is the most common cancer of man[1] and includes all degrees of clinical malignancy from the very common, locally destructive, non-metastasizing basal cell epithelioma to the relatively uncommon, rapidly disseminated, malignant melanoma. The vast majority of skin cancers can be cured by adequate dermatologic surgical, radiation or chemosurgical methods but answers are still wanting to such questions as, "What is the *best* way to treat a particular skin cancer? Which method results in the highest cure rate?" and, "How can the best cosmetic result be achieved?"

In an attempt to answer these questions and others, a clinico-histopathologic study of visible skin tumors, their management, and end results was initiated in 1955 at the New York Skin and Cancer Unit.*

This dermatologic clinic has approximately 75,000 patient visits yearly, of which 12,500 are new patients. Of these new patients, almost one out of twenty presents himself for an oncologic problem.

Figure 1 shows the flow of patients through our institution. New patients registering in the Skin and Cancer Unit are sent to the Oncology Section for diagnosis and recording of the many facts which are considered important for future evaluation. The patients are then referred to the various treatment sections for specialistic dermatologic therapy which, for the most part, is carried out either by the attending dermatologists or by physicians taking post-graduate dermatological training under the supervision of the attending staff.

Upon completion of treatment, the patients re-

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*This work is currently supported by the Lillia Babbitt Hyde Foundation and is under the direction of Dr. Victor H. Witten and the author.

turn to the Oncology Section for continued follow-up. The bulk of the information collected is recorded and coded in such a manner that it later can be transferred to punch cards.† The main categories included on the punch cards are indicated on Figures 2 and 3.

In order to afford complete care of the cancer patient, there should be a common meeting ground for members of the various medical specialties who are intimately concerned with the therapy of skin cancer. This need has been met by a Tumor Conference which meets weekly to examine and discuss the problem cases of neoplasms of the skin and of the visible mucous membranes. This conference is attended by dermatologists, surgeons, radiologists and pathologists, as well as undergraduate, graduate and post-graduate students and staff physicians. This conference provides an opportunity for exchange of thought regarding the various specialty approaches to a given problem, offers the patient a type of consultation often beyond reach of the average clinic patient, and provides excellent teaching sessions for the student and practitioner. In addition, the opinions and recommendations of the members of the Tumor conference are also available to staff members for their private patients.

†International Business Machine Corporation.

Basal Cell Epitheliomas of the Face

Skin cancer includes a wide variety of malignant neoplasms including epitheliomas, malignant melanoma, sarcomas, et cetera. In this brief presentation, it will not be possible to discuss the surgical therapy of all malignancies of the skin. I will therefore limit the subject to surgical management of the most common type of skin cancer, the basal cell epithelioma, in the location it is most frequently encountered, namely, the face.

To date, over 3,000 patients have registered in the Oncology Section of the Clinic. Of this total, certain information concerning the first 600 consecutive patients (January, 1955 to April, 1956) has been abstracted from the punch cards for this preliminary report.* A total of 740 benign

*It should be stressed that this material represents raw data and has not undergone statistical analysis.

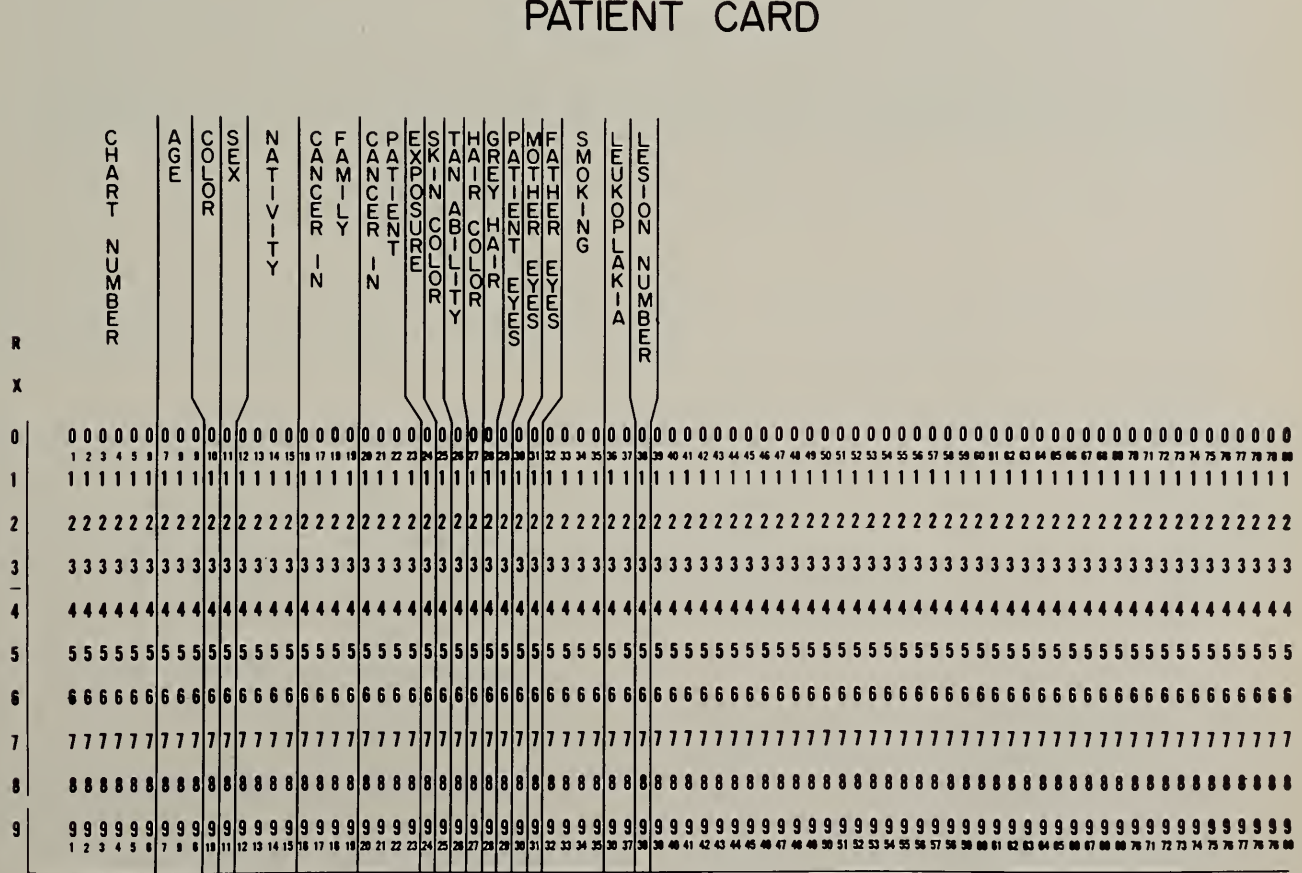


Fig. 2. Punch card illustrating type of information recorded concerning the patient.

and malignant tumors were recorded in these 600 patients, that is, some patients had more than one presenting tumor. Of the 740 lesions, 385 (52 per cent) occurred on the face.

confirmed basal cell epitheliomas was reviewed for certain facts, including:

1. *Age.*—The majority of patients were beyond fifty years of age (Fig. 4).

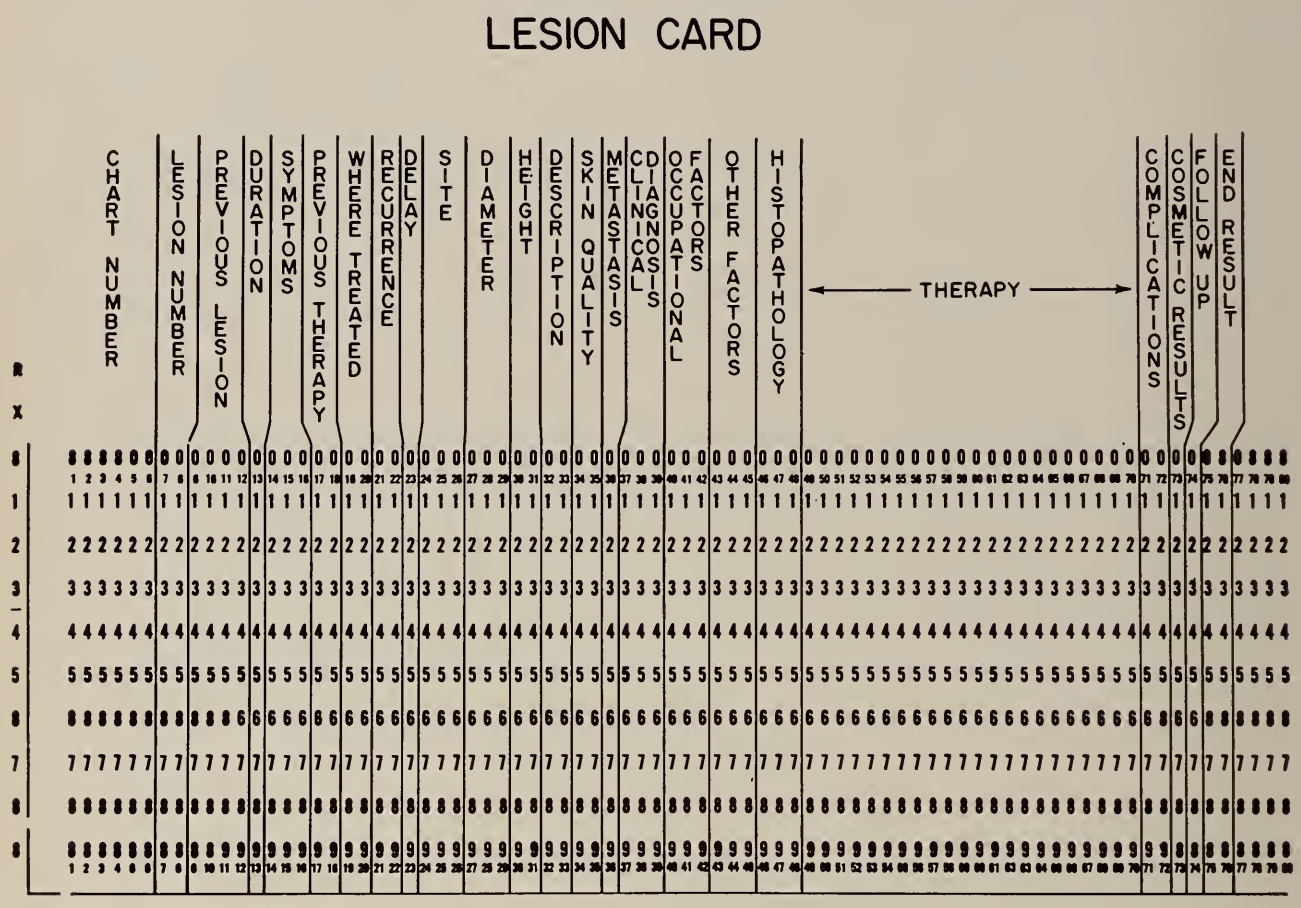


Fig. 3. Punch card illustrating type of information recorded concerning the lesion.

TABLE I. FACE LESION DIAGNOSES

Diagnosis	Diagnosis Based on		
	Histology	Clinical Findings	Total
Basal cell epithelioma	123	33	156 (40%)
Basosquamous carcinoma	2	0	2 (1%)
Squamous carcinoma	16	3	19 (5%)
Malignant melanoma	0	0	0
Precanceroses	30	11	41 (11%)
Seborrheic keratoses	17	14	31 (8%)
Hemangiomas	1	21	22 (6%)
Pigmented nevi	20	35	55 (14%)
Miscellaneous tumors	34	25	59 (15%)
Total	243	142	385(100%)

Basal cell epitheliomas were the most common tumors of the face *for which patients sought medical advice* (156 out of 385). Of the 156 basal cell epitheliomas of the face, 123 were diagnosed histopathologically and the remainder clinically (Table I). The information gathered on these 123

2. *Size.*—Of the lesions 55 per cent were less than 10 mm. in largest diameter, and 96 per cent were less than 20 mm. in largest diameter (Fig. 5).

3. *Color of Patients.*—Whereas 89 per cent of our general clinic population is White, 10 per cent Negro and 1 per cent Yellow, 100 per cent of the basal cell epitheliomas occurred in White patients.

4. *Sex.*—The sex distribution was essential equal (53 per cent men, and 47 per cent women).

5. *Duration.*—Figure 6 illustrates the duration of the presenting lesion prior to the time the patient sought medical advice.

6. *Clinical Diagnosis.*—Of the 123 histologically proven basal cell epitheliomas, 85 per cent were correctly diagnosed clinically by the staff dermatologists. The principal errors occurred in the

differential diagnosis between superficial basal cell epitheliomas and Bowen's disease, and between basal cell epitheliomas and squamous or basosquamous cell carcinomas. In only eight instances to coming to our clinic. It is shocking that the type of "treatment" received by almost one half of those patients previously treated consisted of the application of various ointments.

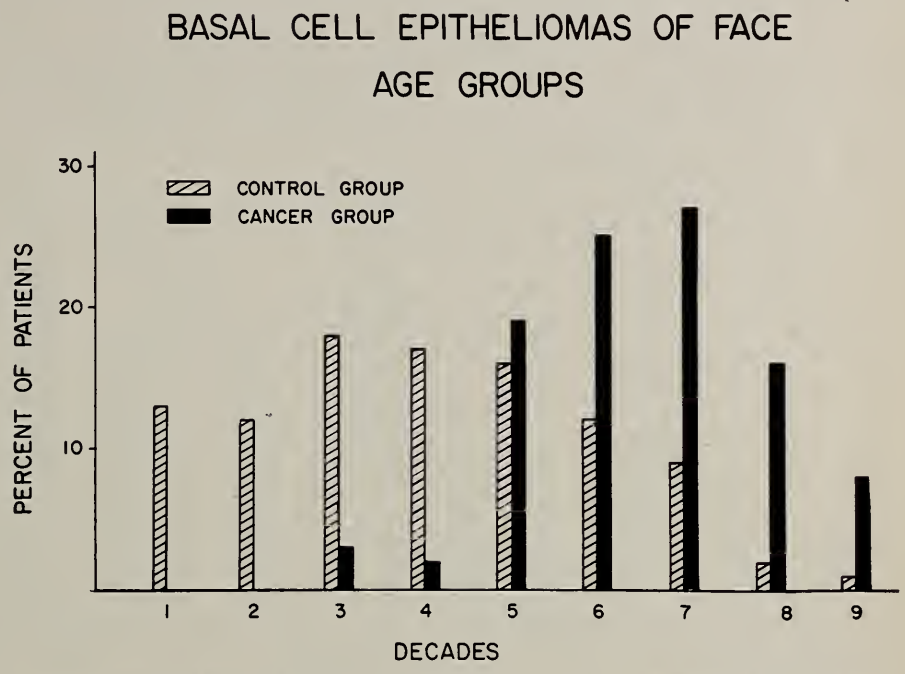


Fig. 4. The "control group" consisted of 252 consecutive patients with various dermatoses chosen from the general clinic population.

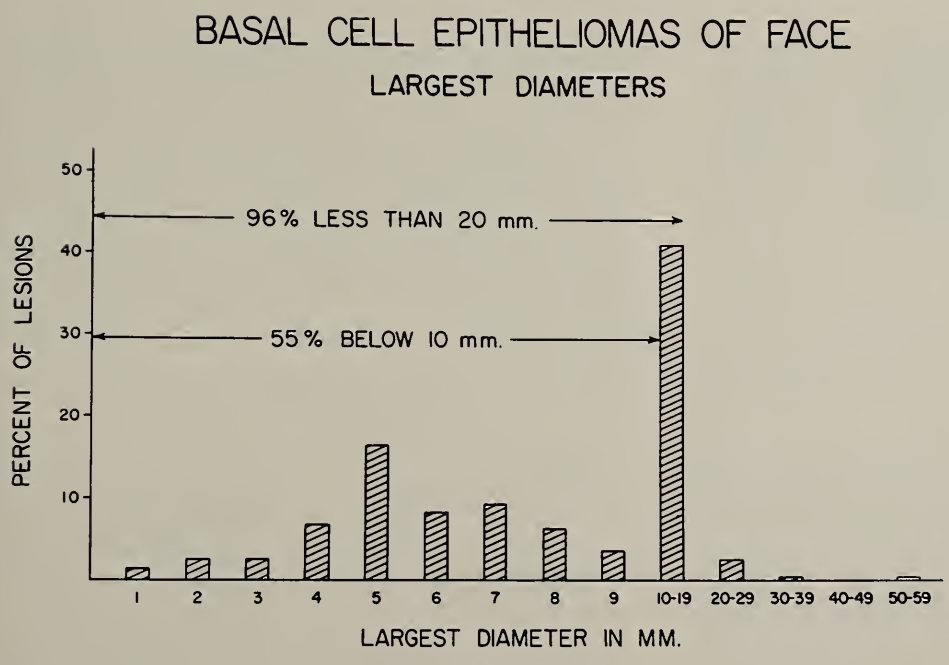


Fig. 5.

were basal cell epitheliomas not clinically diagnosed as malignant tumors but were instead mistaken for benign lesions.

7. *Previous Therapy.*—Of these epitheliomas, 41 per cent received some form of therapy prior

8. *Anatomical Distribution.*—Figure 7 depicts the distribution of the basal cell epitheliomas* on

*Of the total of 740 lesions reviewed in this preliminary study, 175 were histologically proven basal cell epitheliomas. Of these, as stated above, 123 or 72% occurred on the face.

the face showing that the most frequent areas involved are the forehead, cheeks and nose.

9. *Therapy.*—Table II lists the manner in which these 123 basal cell epitheliomas of the face

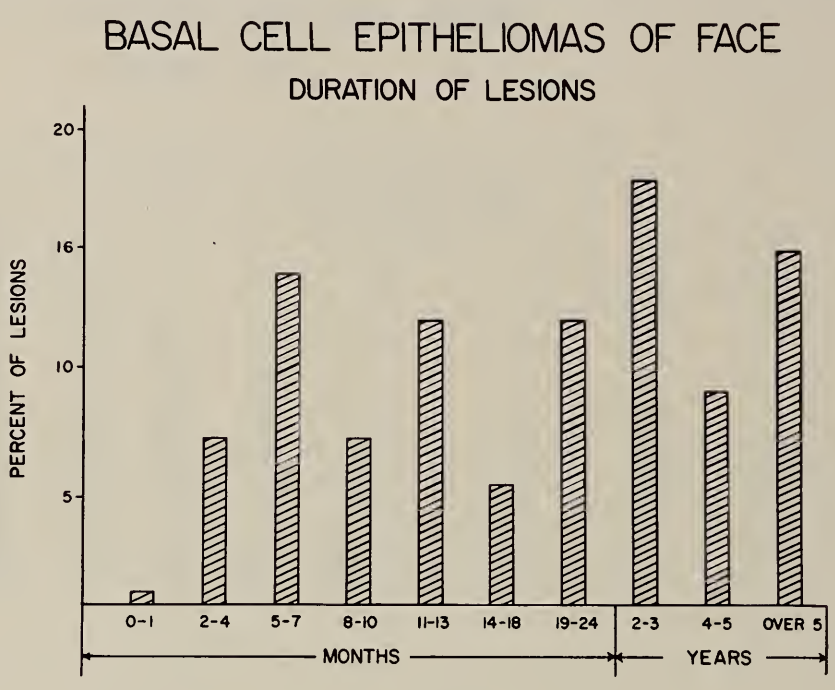


Fig. 6.

TABLE II. TYPES OF THERAPY USED AT THE NEW YORK SKIN AND CANCER UNIT FOR THE TREATMENT OF 123 CONSECUTIVE BASAL CELL EPITHELIOMAS OF THE FACE

Therapy	No. Cases	Per Cent
Electrosurgery	57	46%
Cold steel surgery	37	30%
X-radiation	20	16%
Sherwell method	1	1%
More than one modality	8	7%

were managed in our clinic; 76 per cent were treated by various surgical methods and 16 per cent by radiation.

The prime concern of the dermatologist in the therapy of all basal cell epitheliomas is complete eradiation of the tumor. But because of its common location on the face, an important secondary concern in this management should be to obtain the best cosmetic result possible. With these goals in mind, I would like to pass to a discussion of some of the surgical modalities used by dermatologists for the diagnosis and management of this variety of skin cancer (Table III).

Biopsy

It is extremely important that every skin tumor be subjected to histopathologic examination. This step is essential for the following reasons:

1. Clinical diagnosis always carries with it some chance of error, and, in certain instances the error may result in serious mismanagement. An adequate biopsy specimen examined by a qualified pathologist usually avoids this pitfall.

2. Therapy of some varieties of a given tumor differs according to the histologic type. For example, sclerosing (morphea-like) basal cell epitheliomas are relatively radio-insensitive and are difficult to completely remove by electrodesiccation and curettage because of the dense fibrosis. With few exceptions, then, this type of basal cell epithelioma is usually best treated by surgical excision.

TABLE III. SURGICAL MODALITIES EMPLOYED IN THE MANAGEMENT OF BASAL CELL EPITHELIOMAS OF THE FACE

ELECTROSURGICAL	Electrodesiccation Electrocoagulation Electrocutting Electrocautery
CHEMOSURGICAL	Mohs' technique
COLD STEEL	Scapel Punch Curette
OTHER	Sherwell method

3. The accuracy of statistics of skin cancer incidence, recurrence, radiosensitivity, metastases, et cetera, depends on accurate histopathologic diagnosis. This is vividly exemplified by Becker[2] who

showed that the error in the clinical diagnosis of malignant melanoma approaches 50 per cent. Obviously, any reports of therapeutic results achieved on lesions diagnosed as malignant melanoma on

It is often worthwhile to discuss the technique of performing the biopsy with the pathologist who will be reviewing the sections. The surgeon thus can use the method of labeling specimens pre-

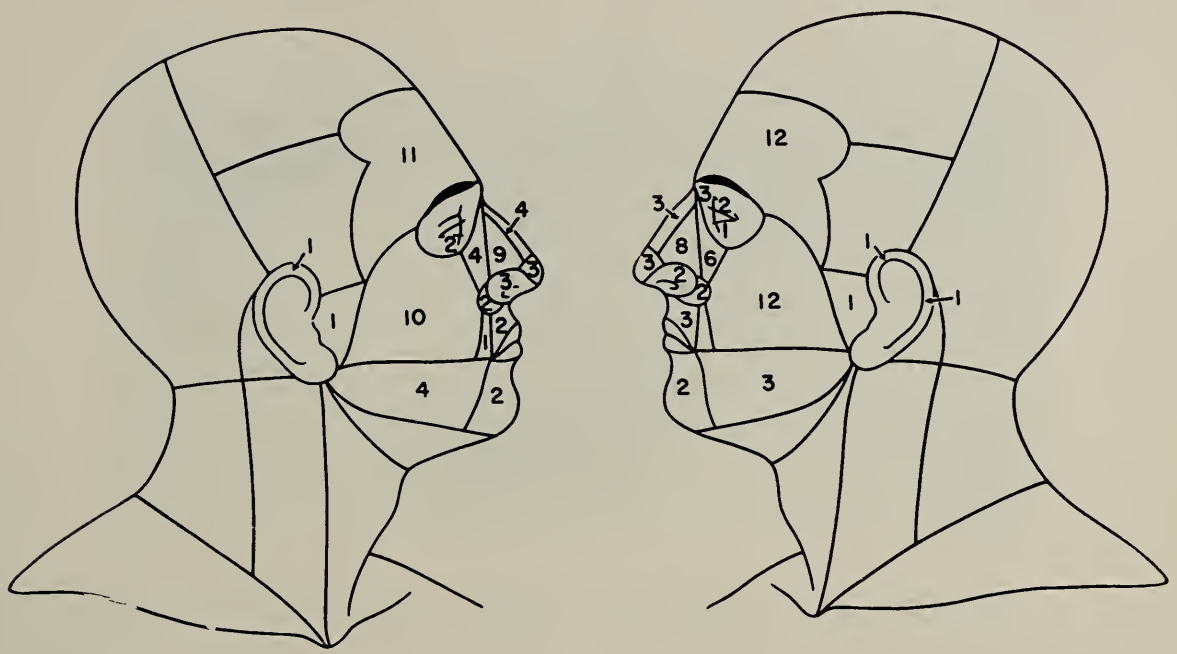


Fig. 7. Anatomical distribution of 123 basal cell epitheliomas of the face.

clinical grounds alone could not be considered valid if the diagnosis was incorrect in half of the patients.

The biopsy may be performed in such a manner that it includes the entire tumor *(excision biopsy)* or only a portion of it *(incision biopsy)*. It is essential that the operative note clearly state which of these procedures was carried out. When the dermatologist is confronted with a relatively large tumor, a tumor in a cosmetically important or relatively inaccessible site, or a tumor which will probably be treated by irradiation, he may justifiably hesitate to remove the entire lesion for histopathologic diagnosis. In such circumstances, a portion of the basal cell epithelioma may be removed with the punch, scalpel, curette, scissors or by the electrocutting current.

What constitutes an adequate biopsy specimen? This depends on the nature and site of the tumor. For example, a 3 millimeter punch biopsy specimen may be entirely adequate for a basal cell epithelioma on the tip of the nase, but would be inadequate for a two centimeter keratoacanthoma at that site. With a few exceptions a well chosen biopsy specimen 0.5 to 1 cm. in diameter will suffice.



Fig. 8. Biopsy technique. Shaded area represents the tumor tissue. Biopsy specimen is bisected by the physician at the time of the operation.

ferred by the pathologist (for example with dyes, incisions or sutures) so that if on microscopic examination tumor tissue is found to extend to the edge of the incision, the precise area can be identified.

What portion of the tumor should be removed for biopsy? The preferred method of obtaining a specimen of a portion of the tumor is illustrated in Figure 8 and has recently been emphasized by Caro.[3] It is important to obtain both normal and pathologic tissue in the same section. The specimen is then bisected by the surgeon (and this step is essential) in order to orient the material in the desired plane for the laboratory technician.

This method has several distinct advantages. It allows the pathologist to study the transition between normal and pathologic tissue. This may be particularly important in such lesions as early Bowen's or Paget's disease, keratoacanthoma, squamous cell carcinoma, et cetera. Also, it may give the pathologist sufficient normal tissue to ascertain from which tissue the tumor originated. The technique, as illustrated, also permits the surgeon to pass his suture through normal, healthy skin, thus avoiding friable tumor tissue when attempting to close the surgical wound.

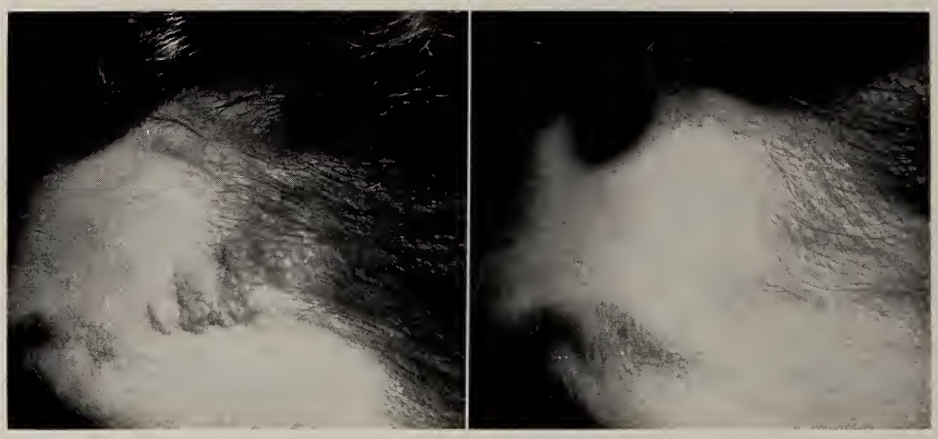


Fig. 9 *(left)*. Longest diameter of tumor (nevus sebaceus) positioned at right angles to wrinkle lines. In this instance, in the attempt to conserve normal tissue, the excision was performed perpendicular to the desired excision lines.
Fig. 10 *(right)*. End result following surgical excision of lesion pictured in Figure 9.

This method of including normal skin in the biopsy specimen is not universally accepted by dermatologists since some feel there is the possibility of incorrectly embedding the specimen during processing so that the sections are cut from the normal portion of the specimen with the result that the tumor is missed altogether. Such an error will be avoided when the pathologist and his laboratory assistants are alive to the problems of dermatohistopathology, and if proper precaution is exercised in preparing the specimen.

Finally the specimen should include tissue from the deepest portion of the tumor. This allows the pathologist to gain some impression as to the invasiveness of the tumor at that site.

Scalpel Surgery

There are some errors in technique which are seemingly common with the use of the scalpel in skin cancer surgery.

One such error is the poor selection of lines of incision to remove the tumor. The skin is under constant tension in all directions, but the magnitude of tension varies from one direction to another. It was shown by Langer[5] that when a round awl was used to produce circular holes in the skin at various sites of the cadaver, on removal of the awl the round defect immediately shaped itself into an oval. Langer then plotted these oval defects on anatomical charts and concluded that the longest diameters of these defects coincided with the directions of greatest skin tension. Langer's lines have been used for many years by surgeons in planning lines of incision for removal of skin specimens by elliptical excision. Although using different techniques Rubin[4] and Kraissel and Conway[5] came to the same conclusion that the time honored use of Langer's lines as longitudinal directions for scalpel incisions was incorrect for certain sites, particularly on the face. They pointed out the importance of taking into consideration the natural skin folds, wrinkle lines and underlying musculature.

However, no illustration of suggested lines for scalpel incision can include all the possibilities and the final decision must depend upon the clinical findings.

At times, the choice of the line of incision is influenced by the configuration of the tumor. For example, when the long axis of the tumor is in a direction which does not coincide with the lines

of wrinkle, it may be advisable to remove the lesion in a manner which conserves the most tissue even though the lines of incision are not in the preferred directions (Figs. 9 and 10).

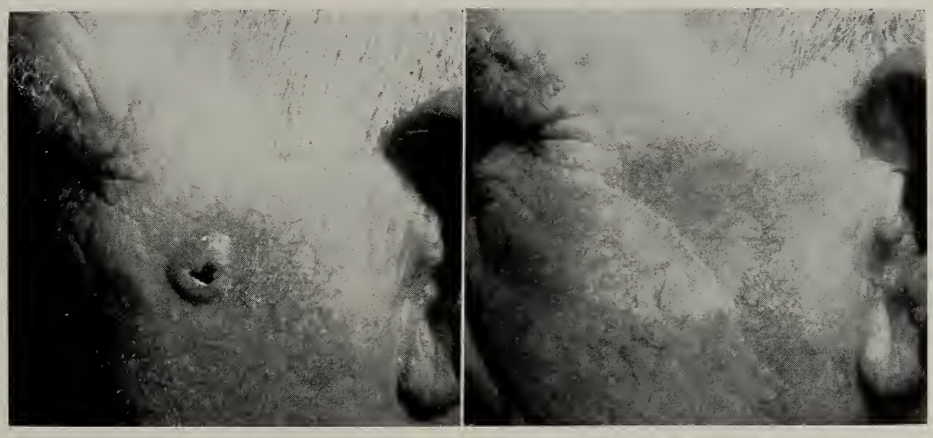


Fig. 11 *(left)*. Squamous carcinoma which was inadequately excised in its depth.
Fig. 12 *(right)*. Same patient as in Figure 11 two years following x-radiation of surgical site.

Another comparatively frequent error in scalpel surgery is inadequate depth of excision. Failure to excise sufficiently deep is evident on microscopic examination of the specimen. When this occurs and pathological tissue is left in the depths of the wound, the physician is often left with a difficult clinical and therapeutic problem since deep recurrences are hard to recognize clinically. If additional surgery is decided upon after examination of the specimen has shown the first excision to have been of insufficient depth, sacrifice of considerable more normal tissue must be made. When a lesion known to be radiosensitive is incompletely excised in its depth, it is often preferrable to employ subsequent irradiation rather than to resort to additional surgery. To illustrate this, Figures 11 and 12 show a squamous cell carcinoma of the malar area which was surgically excised but on reviewing the sections, it was apparent that the depths of the lesion had not been reached and some malignant tissue remained. For this reason, the patient was given x-ray therapy (5440 r in eight exposures of 680 r each at 100 K. V., 0.9 mm. Al.HVL over nineteen days) to the tumor site postoperatively. To repeat surgery in this instance would have necessitated sacrifice of a wide area of surrounding normal skin and subsequent graft.

In most instances of skin cancer surgery, if the incision is carried well into the subcutaneous tissue, the problem of incomplete removal of the deeper portions of the tumor can be avoided. Even though the lesion extends into the subcutis, careful inspection at the time of the operation will usually show a gross contrast between the tumor and the adipose tissue. This allows the physician to extend his procedure to include any macroscopically discernible tumor.

Desiccation and Curettage

The most frequently employed modality by far in the management of basal cell epitheliomas in our clinic and practice is electrodesiccation in conjunction with curettage. This method enjoys its popularity because of its many advantages including, among others, the following:

1. The principal advantage is that desiccation and curettage permits the surgeon to "seek out" tumor extensions with the curette. The physician experienced with the use of the curette can often clearly perceive the difference between normal and tumor tissue simply by the "feel" of the curette as it passes over the tissues. This ability to "feel one's way" through the tumor to its peripheral portions results in less sacrifice of normal surrounding tissue, and minimizes the danger of damage to underlying structures.

2. Electrodesiccation and curettage does not require the time-consuming sterile surgical set-up that is necessary for scalpel surgery.

3. The heat and coagulation produced by electrodesiccation provides hemostasis and dehydrates the tumor and normal tissue permitting thorough curettage in a relatively bloodless field.

As with any destructive procedure, desiccation and curettage also has its limitations. The curette alone generally provides a less desirable biopsy specimen in comparison with that obtained by scalpel or even scissors biopsy. Certain tumors are not suitable for treatment by desiccation and curettage, for example, sclerosing basal cell epitheliomas and deeply invasive tumors involving underlying cartilage or bone. In certain sites, desiccation and curettage may leave a poor cosmetic result such as on the skin of the upper lip, chest and back because of the tendency to produce lasting hypertropic scars in these areas. Wound healing after desiccation and curettage is considerably slower than that following surgical excision with primary closure. A final limitation of this procedure is that the curette cannot follow out thread-like microscopic tumor extensions.

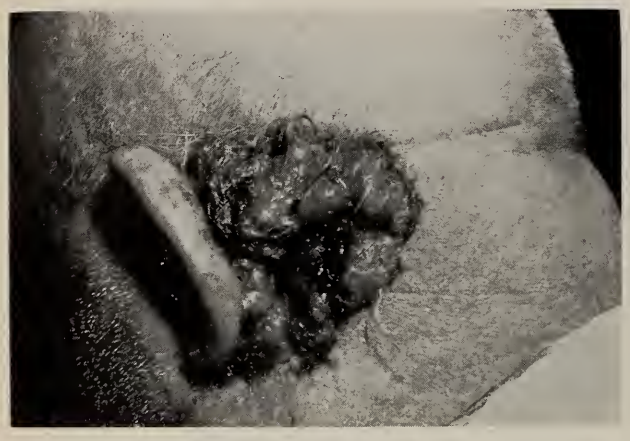


Fig. 13. Example of fungating basal cell epitheliomas in which bulk of tumor tissue should be removed by electrocutting prior to x-radiation.

When preparing the lesion for desiccation and curettage, it is advisable to mark the borders of the area to be treated with a dye (such as genitian violet) since skin landmarks may be obscured by the distension of the tissue resulting from the infiltration of the local anesthetic. The first step in the destruction of the lesion should be curettage since this gives the physician information concerning the consistency of the tumor before it is electrodesiccated. Malignant tumors are generally friable and the tissue can usually be curetted with ease. As a rule, the curette as it is drawn across the surface of the relatively firm normal skin "falls" into an area of soft cancerous tissue. Friability, then, lends weight to the clinical impression that the lesion is malignant. However it should be stressed that not all skin cancers are soft in consistency, and that certain non-malignant tumors (for example, some infectious granulomas) are of a consistency which is indistinguishable by the "feel" of the curette from skin cancer.

Bipolar Electrocutting Current

The electrocutting knife, loop and needle are successfully used as thermal "scalpels" for the removal of skin tumors. The electrocutting current has received only limited use in the treatment of basal cell epitheliomas in our clinic with a few exceptions. In certain fungating basal cell epitheliomas (Fig. 13) which are to receive x-radiation, the bulk of the tumor tissue extending above the surface of the skin is removed by the electrocutting current before irradiation is begun. Should the fungating tissue not be removed prior to irradiation, a large friable, malodorous, disintegrating mass results. This combined therapy is advisable since on the one hand, because of the invasiveness or extent of the lesion, it cannot be properly managed by electrodestructive procedures alone (for example desiccation and curettage) and, on the other, if irradiated, the resulting necrosis of the tumor would be extremely unpleasant for the patient for weeks thereafter. By combining the two methods, certain large tumors can be properly and well managed particularly in patients who are poor surgical risks or who refuse major operative procedures.

The advantage of the electrocutting current in this instance is that the coagulation of blood vessels prevents excessive bleeding simplifying the surgical removal of the bulk of the tumor.

Sherwell Method

The acid nitrate of mercury technique of Sherwell is employed in our clinic on selected patients for the management of basal cell epitheliomas.

In this procedure, the area is anesthetized and the lesion is removed by thorough curettage. It should be stressed that the curettage is the essential part of this method. Following the curettage, acid nitrate of mercury* is applied to the base of the defect and allowed to remain for five to twenty minutes. Finally a paste of sodium bicarbonate made by adding a small quantity of water to the powder is spread onto the area to neutralize the excess acid. Following this, a dry dressing

*Red oxide of mercury 40.0
Nitric acid 45.0
Water, to make 100.0

is applied to cover the paste. The dressing is left in position for several days and then changed as needed until the wound is healed.

Although there is no proof, the theoretical advantage of this procedure claimed by its advocates is that tumor tissue is considerably more sensitive to the destructive effects of the acid nitrate of mercury than the normal tissue and therefore if any tumor cells remain they are "selectively" destroyed. In addition, some proponents claim that the resulting scar is more pliable and therefore cosmetically more acceptable than that obtained with curettage only, but this too remains to be determined by long term observations.

Special Methods

Other surgical techniques used by dermatologists in the management of basal cell epitheliomas of the skin include circular punch full-thickness grafting procedures, chemosurgery (Mohs), and dermabrasion (in the management of "multicentric" superficial basal cell epitheliomas). These, and other highly specialized procedures are receiving increasing employment by those who have acquired the necessary skill in their application.

Role of the Dermatologist

The more experience one accumulates in the field of cutaneous oncology, the more precise become the indications for the management of each tumor as an individual problem. Therefore, it is not correct to say that a given modality *should* be employed for a certain group of tumors since many additional factors peculiar to the case must be taken into consideration. In relation to the *patient:* the age, sex, color, occupation, healing and scarring potential; in relation to the *tumor:* its history, site, pathology, radio-sensitivity, local extent and presence or absence of metastasis; in relation to the *physician:* his qualification, ability and facilities, these are among the most important features which play their role in the final decision of definitive therapy for the presenting tumor.

The dermatologist is in an ideal position to manage most cutaneous malignancies. His training and experience in the differential diagnosis of cutaneous disease, including skin cancer, puts him in the fore as a clinician. Among specialists, only he is equipped and trained to use any or all modalities (cold steel surgery, electrosurgery, chemosurgery, x-ray, use of radioactive materials, et cetera) commonly used in skin cancer therapy. This permits the necessary individualized approach to each presenting problem. Undoubtedly his knowledge and experience in differential diagnosis coupled with his versatility and elasticity in selection of therapeutic modalities places the dermatologist in an unexcelled position among specialists in the management of the majority of skin neoplasms. But it is only through his continued critical analysis of the results of the various therapeutic modalities employed in the management of cancers of skin that the dermatologist will be able to answer for himself the question, "What is the best method for treating a given skin cancer in a particular individual?"

Summary

1. Skin cancer is the most common cancer of man and includes a wide variety of neoplasms. A thorough understanding of the natural history and degree of malignancy of these lesions is prerequisite to intelligent management.

2. Most skin cancers are amenable to treatment with dermatologic therapeutic modalities, but each method must be given careful, renewed consideration for every presenting lesion.

3. Some common problems and procedures in relation to the dermatologic surgical management of basal cell epitheliomas of the face are discussed.

4. Surgical management of cutaneous malignancy remains highly specialized and requires clinical experience, surgical training in the various methods employed, and knowledge concerning the ultimate effectiveness and cosmetic result of the procedures used.

The material on basal cell epitheliomas of the face was presented in part at the Annual Scientific Session of the American Cancer Society, New York, October 29, 1957, and has subsequently been published in the proceedings of this meeting.

References

1. Heller, J. R., Cutler, S. J., and Haenszel, W. M.: Some observations on the epidemiology of cancer in the United States. J.A.M.A., 159:1628, 1955.
2. Becker, S. W.: Pitfalls in the diagnosis and treatment of melanoma. A.M.A. Arch. Dermat. & Syph., 69:11, 1954.
3. Caro, M. R.: Skin biopsy technique. A.M.A. Arch. Dermat. & Syph., 76:9, 1957.
4. Rubin, L. R.: Langer's lines and facial scars. Plast. and Reconstruct. Surgery, 3:147, 1948.
5. Kraissl, C. S., and Conway, H.: Excision of small tumors of the skin of the face with special reference to the wrinkle lines. Surgery, 25:592, 1949.



Fig. 1 *above. (a)* Old traumatic nasal bone deformity. *(b)* Realignment of nasal bones following refracture.

Fig. 2 *below. (a)* Deformity of osseous and cartilaginous framework. *(b)* Eight months after correction.

Correction of

THADDEUS J. LITZOW, M.D.
Rochester, Minnesota

A crooked or deformed nose is one of the most psychologically damaging facial blemishes. Proper correction of such abnormalities is gratefully received by the patient, whose entire outlook on life usually is changed by the improved appearance. Technics for correcting nasal deformities are illustrated here.

THERE ARE many nasal deformities that deserve correction to a normal appearance. Only occasionally a patient presents himself with a complaint of a nasal defect so small that whether to categorize his nose as abnormal or deserving of surgical correction depends on the examiner's personal aesthetic values. A goodly number of the nasal deformities are quite evident at first glance, and several examples of such cases will be presented.

One deformity that the patient usually considers an emergency is the immediate traumatic nasal fracture. Any physician may be called on to deal with this problem. If seen early after the injury, the nose can be examined easily before edema swells the soft tissues and makes inspection and palpation of limited value. Roentgenologic study can be helpful, but usually one relies on his clinical examination.

Fractured nasal bones that are not displaced require no special treatment. A properly applied nasal splint does no harm and serves as a guard against later displacement.

Displacement of fractured nasal bones can be reduced immediately, the patient's general condition permitting. Satisfactory anesthesia usually can be obtained by local application to the nasal mucosa of a suitable topical anesthetic such as cocaine. A fine instrument such as a small, blunt periosteal elevator inserted into the nasal cavities can apply

Nasal Deformities

Dr. Litzow is in the Section of Plastic Surgery, Mayo Clinic, Rochester, Minnesota.

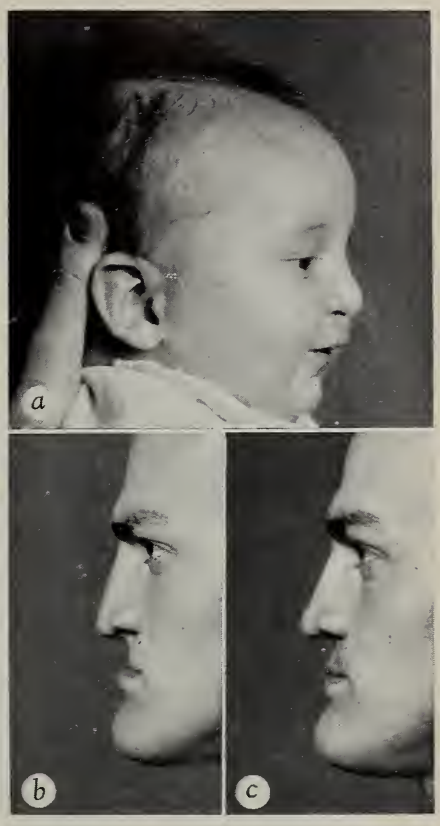


Fig. 3. *(a)* Shortened columella and depressed nasal tip after recent operation for bilateral cleft lip. *(b)* Uncorrected nasal deformity after repair of bilateral cleft lip. *(c)* Columella lengthened by advance of prolabium of upper lip, nasal tip assuming more normal position with satisfactory nasal profile.

pressure to reduce inward displacement. Outward displacement is reduced by direct external pressure. Inspection and palpation tell when the reduction is adequate. Then the nose is splinted for seven days.



Fig. 4. *(a)* Shortened central portion of the upper lip is prolabium used to lengthen columella. *(b)* Sufficient tissue from lower lip was transferred to fill defect previously occupied by prolabium and gave necessary added length.

A questionable nasal fracture with marked soft-tissue swelling requires checking from time to time until most of the edema subsides. Then an adequate examination of the supporting structures of the nose can be made with the assurance of correct diagnosis. If a fracture with displacement of bone is found, correction is accomplished as described above.

Treatment of the more extensive nasal bone fractures, injuries, and displacement of the nasal septum will not be discussed here. The reader is referred to standard textbooks of plastic surgery for further details.

If the displacement of fractured nasal bone is not reduced before healing, a permanent deformity follows, as illustrated in Figure 1a. Refracture with a sharp chisel and realignment are necessary to correct the defect (Fig. 1b). Selection of this patient or any patient for a cosmetic procedure demands close scrutiny. The criteria for rhinoplasty have been presented in full by Erich.[1]

Some deformities are marked, and the patients' desire for correction is strong. The deformity of the boy in Figure 2a was such an example, affecting both the osseous and the cartilaginous structures and requiring mobilization of both to obtain a satisfactory realignment (Fig. 2b).

The incidence of cleft lip or palate has been estimated conservatively as one in every thousand live births. It is not surprising then that the surgeon is called on frequently to close these defects

and correct the associated nasal deformities. Bilateral—and usually unilateral—cleft lips have nasal deformities characteristic to each.

The profile view of a recently repaired bilateral cleft in the lip of an infant demonstrates the shortened columella which pulls the tip of the nose down (Fig. 3a). A similar view of a repaired bilateral cleft lip in an adult with the still-uncorrected shortening of the columella is seen in Figure 3b. Advancement of the prolabium lengthens



Fig. 5 *above. (a)* Nasal deformity commonly associated with cleft in left upper lip repaired previously. *(b)* Nasal deformity corrected.

Fig. 6 *below. (a)* Large nose with hump and slightly drooping bulbous tip. *(b)* Early postoperative result.

the columella and gives a pleasing profile (Fig. 3c). An Abbe-Estlander flap from the lower lip replaces the advanced prolabium (Fig. 4a and b) and restores a more normal appearance to the upper lip. The profile of the lips also is improved with this method (Fig. 3c).

The nasal deformity associated with unilateral cleft lip usually consists of a widening and flattening of the nostril on the affected side (Fig. 5a), with corresponding flattening or depression of the adjacent aspect of the tip of the nose. The entire nasal deformity reflects the malformation of the alar cartilage accentuated by the lip cleft widening the base of the nostril or actually extending into the nostril. Repair of the nasal portion of the cleft-lip deformity requires closing of the cleft and narrowing of the widened nostril to conform to the opposite normal side. The deformed alar cartilage on the side of the cleft is reshaped to establish normal symmetry (Fig. 5b).



Fig. 7 *above. (a)* Wide nasal tip. *(b)* Nasal tip narrowed.

Fig. 8 *below. (a)* Rhinophyma. *(b)* Early postoperative result.

Probably one of the most commonly seen congenital deformities is the humped nose with a drooping bulbous tip and large over-all size. Usually a satisfactory correction can be accomplished (Fig. 6a and b). Correction of the bulbous tip is best demonstrated by special views such as Figure 7a and b.

The older patient having escaped the congenital or traumatic deformities may yet acquire nasal dimensions that need correction. Rhinophyma, a complication of acne rosacea, may increase the size of the nose to tremendous proportions. The tissue is pared down to proper size (Fig. 8a and b), usually in one operation.

Loss of soft-tissue covering of the nose can be restored by skin grafts and flaps. Usually a nose partially or entirely lost can be reconstructed by utilization of the patient's own tissues. If for any reason reconstruction cannot be done, a prosthesis can replace the lost tissues.

Reference

1. Erich, J. B.: The selection of patients for rhinoplasty. Surg., Gynec. & Obst., 106:481, 1958.

Asthma in Infancy and Childhood

Results of Allergic Management

A family pediatrician, not a pediatric allergist, reports his results of handling 208 allergic children under twelve years of age, eighty-one of whom had asthma. His methods of evaluating, treating and following these infants and children are reported.

The family doctor and the general pediatrician can do much in their own back yard with the management of allergic asthma in infancy and childhood.

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ASTHMA is defined by Rubin[1] as "an allergic disorder of the respiratory system, characterized clinically by paroxysms of an expiratory type of dyspnea with wheezing, and anatomically by a generalized obstructive emphysema." Glaser[2] defines it as "a form of obstructive emphysema which involves both lungs. It is characterized by paroxysmal attacks of dyspnea chiefly expiratory in nature and is accompanied by wheezing heard on auscultation. It is typically relieved by sympathomimetic drugs." Such a definition is not all inclusive, inasmuch as patients under two years of age may have dyspnea on the inspiratory phase of respiration. They do not show the anxiety exhibited by adults or older children, and may be quite comfortable when flat on their backs. This is in contrast to older children and adults who seek relief by sitting erect.

Asthma may be confused with other conditions in infancy and childhood. Some of the common conditions mistaken for asthma are:

1. Mucus in the nose and throat
2. Enlarged adenoids with stertorous breathing
3. Retropharyngeal abscess
4. Relaxed epiglottis
5. Anomalies of the great vessels
6. Rarer narrowings of the respiratory tract: foreign body, tumor, lymphadenopathy
7. Cystic fibrosis of the pancreas
8. Nocardiosis
9. Laryngo-tracheo-bronchitis
10. Ayerza's disease
11. Localized hypertrophic emphysema

Most of these conditions, if they are thought of, can be ruled out fairly simply by appropriate laboratory, x-ray and physical examinations. A differentiation can be simplified by the fact that in nonasthmatic conditions there is no response to epinephrine, no post nasal eosinophilia, and no changes in the cells of the nasal mucosa which are characteristic of the allergic state as demonstrated by Bryan.[3]

Asthma of allergic origin is caused by an antigen, which may be inhaled or enter through the G.I. tract. This, in turn, reacts with an antibody on or in the sensitized cell, with the release of histamine and other chemical mediators, such as the slow reacting substance, 5-hydroxytryptamine, acetylcholine or heparin. These in turn react on the smooth muscle and the blood vessels of the shock organ.[4]

Flensborg[5] found that of 298 asthmatic children, 190 male and 108 female, under ten years of age, asthma was three times as frequent in boys as in girls. With nonspecific management, 40.3 per cent of the attacks ceased, 54.7 per cent still had attacks and 5 per cent or fifteen of the children were dead. Five of these children died in status asthmaticus, and ten of intercurrent disease not related to asthma. In 8.6 per cent, the attacks were more frequent, and 71.2 per cent the attacks were less frequent at the end of ten years. These children had been treated by allergic management without hypo-sensitization. Engstrom and Kraeplin[6] found that out of 110 asthmatic children treated with hyposensitization for two to four years, there was improvement noted in 84 per cent and absence of symptoms in 71 per cent. They empha-

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size that the duration of asthma had no effect on the results and advised that treatment must be continued at least two years.

I should like to report on the results personally obtained with asthmatic children in a pediatric practice where allergy is done by an interested M.D. who does not limit himself to pediatric allergy. These results, I am sure, can be duplicated by any pediatrician who is willing to spend the necessary time with his patients. In order to do satisfactory work, one day a week was set aside for allergy patients. Each patient had a detailed history recorded following the outline proposed by Glaser[2] together with a complete physical examination, including x-rays of the chest and other pertinent laboratory work.

Intradermal tests were done after the method of Rinkel.[7] These tests included all of the pollens found in this area, house dust (Endo dust®), three of the common molds and a mold mixture consisting of twelve less frequently found molds. In addition, tests were done for the epidermal offenders: feathers, wool, cat, dog, goat, et cetera.

The often repeated statement that skin tests can not be done in infancy and early childhood is a canard. Technically it may be more difficult, but it is possible to do satisfactory tests at a very young age. Several of these patients were satisfactorily tested under a year of age. The reactions, however, seem to be less intense in infancy and more positive tests are obtained to foods than to inhalants. Scratch tests are done for foods which the patient may eat. Individual food tests are done for the most commonly implicated foods; some of these individual food tests were done in the office and others were done at home by the parents. These tests[8] are done by omitting the food to be tested for a period of at least four days, and not more than twelve days, and then feeding it at noon of the fifth day under controlled conditions. An increase of at least twice the frequency of cough, sneezing or nasal drainage constitutes a positive test. Foods implicated by history or scratch test were tested by direct feeding. I would like to emphasize the fact that slavish reliance on scratch tests for food sensitivity is most disappointing, inasmuch as Rinkel states that food tests in asthma show an accuracy of only 38 per cent.[8]

At the conclusion of the inhalant testing, the parents are given instructions in detail. It has been found satisfactory to talk to them while recording the instructions on a dictating machine, a copy of this is then incorporated in the patient's record and other copies are given to the parents and the referring physician. Liberal use is made of printed forms such as "methods of avoiding house dust." The problem of dogs and cats as pets for allergic youngsters is discussed. As you know, there should be no cats or dogs in an allergic household. Foods are not routinely tested by individual tests where asthma is strictly seasonal and there are no signs of food allergy. The symptoms which lead us to incriminate foods are: (1) the history of itching in the back of the throat or the roof of the mouth, (2) attacks occurring in the middle of the night, (3) a history of exacerbation of symptoms every two to three days unrelated to seasonal changes in the pollen count. Individual food tests usually done in the office are: wheat, egg, milk, and corn, these being statistically the most important food allergens. Others may be tested at home by the parents.

In addition, the parents are given instructions in allergic prophylaxis, such as rotating the diet, the need for tetanus toxoid, choice of vocation, and choice of climate. Finally recommendations for symptomatic therapy are given.

At the present, I should like to report on the results of the treatment of eighty-one children under the age of twelve years, of whom fifty-one were boys and thirty girls. During the period that these eighty-one were seen, a total of 208 patients with allergic symptoms severe enough to warrant a complete allergic workup were seen in this office. Asthmatic children, therefore, in this series constitute approximately 39 per cent of the allergic children studied. Of the eighty-one asthmatic children, fifteen had their onset before one year of age, and fifty-six had their onset before the age of five. In these eighty-one patients, forty-three were found to have some food allergy. These foods were distributed as follows: milk eleven, wheat ten, egg nine, corn nine, chocolate three, peanut three, orange juice two, pork two, beef two, strawberry two, walnut two, apple two, and garlic, peaches, tuna and tomato one each. The commonest inhalant allergen was house dust. Only four of the eighty-one patients did not react to Endo dust in a dilution of 1:1000. Fourteen of the patients did not react to ragweed even in a dilution of 1:100 intradermally.

I personally attempted to divide the patients under therapy into those showing marked improvement, those showing slight improvement, and those

unimproved or worse. Of these eighty-one patients, ten had been followed too short a time for valid interpretation or could not be traced; therefore, a total of seventy-one patients have been followed for an adequate period of time. Of these, forty-two were markedly improved, eleven were slightly improved and eighteen were unimproved. These eighteen included all who did not continue therapy and those who would not cooperate in the food testing. Ten of these eighteen patients did not cooperate for what was considered adequate therapy; that is, they did not do individual food tests or did not continue for adequate hypo-sensitization. Six took less than eight hyposensitization doses. This leaves a total of sixty-one patients, a number which is probably not statistically too significant, who received what I considered adequate therapy. Of these, forty-two or 68 per cent, were markedly improved, eleven or 18 per cent were somewhat improved, nine or 14 per cent were unimproved. It might be added parenthetically that only five of these patients had Cortisone or other steroid therapy and only one received long term steroid therapy.

In order to get the parents' reaction to allergic management, post cards were sent to all of these patients. These contained two questions under which they were given three choices.

1. The present status of the patient:
   (a) no asthma during the past year
   (b) asthma occasionally, not a serious handicap
   (c) asthma frequently, a serious handicap
2. Do you think allergic management:
   (a) helped a great deal
   (b) helped a little
   (c) was of no value

We received answers from fifty-eight patients. Of these thirty-five or 61 per cent felt they had received marked help from allergic management; fourteen or 24 per cent felt they were helped a little; six or 10 per cent felt they had received no help; three or 5 per cent did not answer this question. As to the present status, ten of the fifty-eight or 17 per cent had had no asthma during the past year; forty-one or 70 per cent had had asthma occasionally but not severely; and seven or 13 per cent were having severe asthma attacks.

Even with our present admittedly imperfect knowledge of allergic disease it is possible to help the majority of children with asthma. Can men interested in pediatric cardiology, psychologic medicine, nephrosis or cystic fibrosis of the pancreas, all of these being entities which are fairly commonly seen in the pediatric practice, point to any better results? In a much larger sense, the awakening interest of any pediatrician in allergic problems will lead him to an awareness of the many facets of allergy in his day to day practice, such as the night cough, relieved by removing a feather pillow; the diarrhea due to milk in a premature infant; the metamorphosis from a screaming colicky baby to a placid infant in a milk sensitive newborn; or the clearing of a severe eczema in a nursing infant by taking the mother off eggs—all of these things being done without a formal allergic work-up. The field of pediatrics is a rapidly changing one. Allergies are assuming a greater importance in pediatrics each year.

Summary

The results of allergic management in a series of eighty-one children under twelve years of age are reviewed. By the pediatrician's evaluation, 68 per cent were markedly improved, 18 per cent were somewhat improved, and 14 per cent were unimproved. By parental evaluation, 61 per cent received marked help from allergic management, 24 per cent received some help and 10 per cent were not helped. Fourteen per cent of the children were free of attacks for one year and 73 per cent were having mild asthmatic attacks not enough to be considered a serious handicap. Thirteen per cent were still having severe asthma.

References

1. Rubin, M.: Nelson, Text Book of Pediatrics. 6th edition. Philadelphia: W. B. Saunders and Company, p. 1438, 1954.
2. Glaser, J.: Allergy in Childhood. Springfield, Illinois: Charles C Thomas, 1956.
3. Bryan, W., and Bryan, M.: Transactions of American Academy of Opthalmology and Otolaryngology, May-June, 1953.
4. Logan, G.: Mechanisms of the immediate allergic reactions and some therapeutic implications. Am. J. Dis. Child., 97:2, 1959.
5. Flensborg, E.: Prognosis for bronchial asthma in infancy. Acta Paed., 33:5, 1945-46.
6. Engstrom, I., and Kraeplin, S.: Specific Desensitization in Bronchial Asthma in Childhood. Acta Paed., 46:81, 1957.
7. Rinkel, H.: Inhalant allergy. Ann. All., 7:625, 1949.
8. Rinkel, H., Randolph, T., and Zeller, M.: Food Allergy, Springfield, Illinois: Charles C Thomas, 1951.

Carcinoma of the Oral Cavity
Part II

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Methods of Radiation

It has been our experience in treating mouth cancer over many years that radium combined with roentgen rays has resulted in the highest possible cures with the lowest number of sequelae and recurrences in carcinoma of the mouth. By combining two qualities of radiation, a much higher dosage of radiant energy can be given to the involved tissues with less permanent tissue damage than is possible with one modality alone. This method was evolved by Lain and Roland,[7] our predecessors, after many years of treating external skin cancers with this means, as well as oral cancers. Quoting from Quick[18] on the treatment of oral cancer, "I believe it is better practice to employ two sources and qualities of radiation than over-extending one per given quantity of radiation. The normal tissues within any field will react less violently to a combination of roentgen rays and radium than one or the other source alone."

In discussing the combination of therapy with various physicists, it is felt that the time element of various daily doses of x-rays and the continuous treatment over four to seven days with radium gives the tissues much more chance to recover. It is also known that the erythema dose of radium and filtered x-rays in combination is much higher in the number of combined roentgens required to produce in erythema at one sitting than the use of either one modality alone.[9] It is felt that this is also a factor in the excellent cosmetic results.

Oral Hygiene During Treatment

Because of the large number of the newer antibiotics in existence today such as tetracycline, et cetera, it is felt that there is no great danger in causing a sensitivity to penicillin by its prophylactic oral use of 200,000 units tablets T.I.D. during the time the needles are in the mouth. The oral penicillin administration may be continued ten days to two weeks following removal of the needles if it is indicated.

Résumé of Treatment and Results—1949-1959

The fifty-four patients studied with follow-ups as to method of treatment and cure rates was a long, exhaustive procedure; but, a careful study of a smaller group of private patients can be instructive. In order to report these results, the use of Table III will make for brevity. There are certain rules in treating this type of case which seem more or less routine to one who encounters these problems regularly, but they will be enumerated and discussed here.

TABLE III. RÉSUMÉ OF TREATMENT
(1949-1954)

Method of Treatment	Number of Patients
Interstitial needles only	1
Interstitial needles +coned filtered x-ray +radium intra-oral pack	2
Interstitial needles +coned filtered x-ray	5
Interstitial needles +coned filtered x-ray + external x-ray	19
Intra-oral radium pack and diathermic removal	2
External filtered x-ray +coned filtered x-ray	4
Interstitial needles +coned filtered x-ray +external filtered x-ray +intra-oral radium pack	12
Radium intra-oral pack +coned filtered x-ray + external filtered x-ray	6
Intra-oral radium pack +external filtered x-ray	3
Total	54

There are very few areas in the buccal cavity which give a flat surface in which a given dose of x-rays and radium can be exactly uniform or homogeneous. It is known that through the years in our treatment some areas received a combined x-ray and radium dosage of well over 11,000 r., but when a cure is accomplished it is known that the tumor received at least a lethal dose of 7000 combined r's *in all areas.* The mucous membranes of the mouth can take a dose of 12,000 r. with a combination of x-rays and radium with safety. The x-ray was produced by 170 K.V. machine, HVL 0.5 to 1 mm. Cu., and the radium consisted only of the gamma rays of radium.

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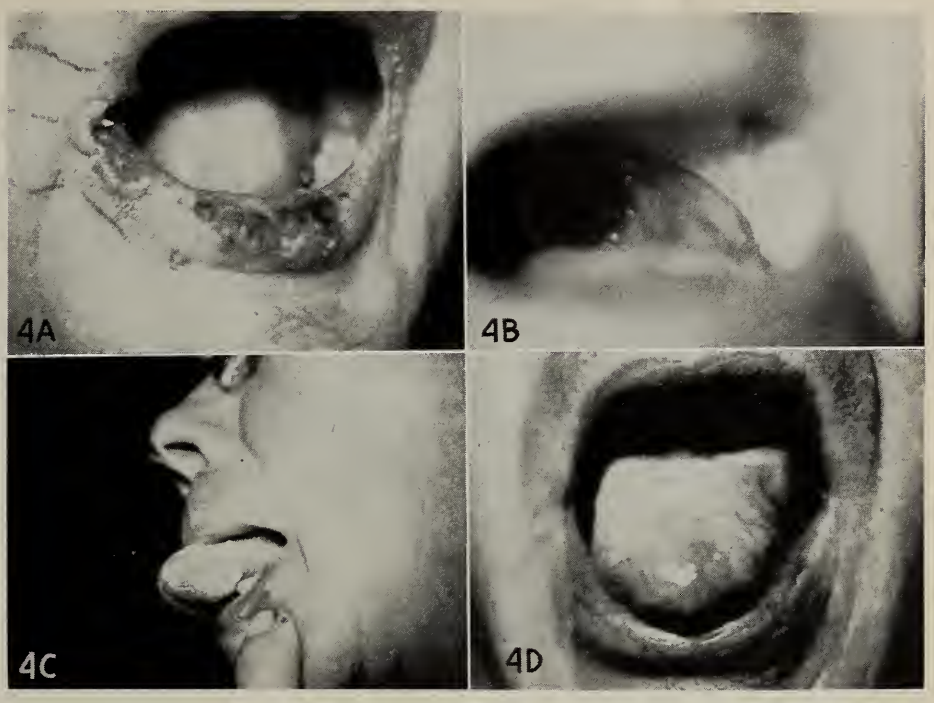


Fig. 4. (A). Squamous cell carcinoma involving two-thirds of the lower lip with extension 2.5 cm. into the commissure and the inner angle of the mouth and interdental buccal area (P_3N_0). Patient is a four-year cure with combined filtered x-rays in divided fields and interstitial radium. (B). Twelve-year cures in the left posterior tonsillar and upper posterior buccal areas with combined filtered x-rays, external radium application and interstitial needles. (C). Squamous cell carcinoma (P_1N_0) arising in leukokeratosis on the left side of the tongue. (D). Complete cure of the cancer and clearing of the surrounding leukoplakia with interstitial radium and combined filtered x-rays.

Carcinoma in the mouth usually occurred as a lump, a bleeding sore, or a verrucous, elevated growth of varying lengths of duration. The shortest time of duration was recorded as two months and the longest time was two years. The average duration in the fifty-four patients was 9.1 months. The lesion frequently was not tender, but the patient would complain of an irritation next to the dentures. Lesions of the gingiva have been known to grow extensively under fixed inlays. The size of the lesion varied in the fifty-four patients from 1.5 cm. in twelve cases, 2 cm. in eighteen cases, 3 cm. in twelve cases (all in the group P_1) up to 5 cm. in only two cases (P_2). Thus it is noted that the most frequent lesion seen in private practice was P_1 or, 1.5 cm. to 2 cm. in size.

In the more advanced lesions, the tumor may infiltrate deep into the intrinsic or extrinsic muscles of the tongue, or on the gingiva into the mandibular bone to produce erosion or destruction of the bone. The close proximity of these growths to the lymph nodes of the neck accounts for the ease of spread to these glands and makes it mandatory to include all the submaxillary areas in any treatment planning. The high rate of dissemination in oral cancer is best explained by Martin and Martin[20] by the fact that tumor emboli can easily be dislodged into lymphatic channels from a mouth which is almost constantly in motion, even during sleep. Hematogenous dissemination to distant sites is rare. In our fifty-four patients the usual site of metastasis was in the submaxillary region or deep, jugular chain.

There are numerous and varied surgical and radiation techniques by which these oral tumors are attacked at various treatment centers. The current surgical approach to this disease is one of resection of a block of tissue totally encompassing the tumor, including, at times, the adjacent bony structures such as the mandible or maxillae with a complete neck dissection. This method is a major surgical procedure and the great loss of tissue and deformity produced make it a very unpopular procedure with the patients; neither are the results dramatic as to cure.

In the failures to cure the growth by irradiation, these operations are then a necessity and sometimes after the highly malignant growth has been reduced in its malignancy by irradiation it is curable. The present-day radiation techniques in

our hands include the use of interstitial radium sources, intra-oral molds or "suckers" of gamma radium, and intra-oral and external x-ray therapy. There are very few areas in the mouth which

TABLE IV. RESUME OF RESULTS
(1949-1954)

Results of Treatment					
3 Year Cure	4 Year Cure	5 Year Cure or More	Death by Oral Cancer After Cured 5 Years	Lost Tract of	Deaths by Oral Cancer
1	1	37	2	1	14

5 Year Cure Rate=68.3%

lend themselves to treatment with one modality alone:

1. In the lateral buccal areas or at the intradental line the procedure was interstitial radium therapy (a dosage of 6000 r. to 7000 r.), plus intra-oral x-rays 170 KV HVL 1 mm. cu. with a cone (2400 r. or 240r.×10), and external x-rays to the gland-bearing areas (2400 r. or 240r.×10); (Fig. 3-C and D). Figure 4-A shows a squamous-cell cancer involving two thirds of the lower lip and a 3 cm. area into the right inner buccal mucous membrane. The cancer was entirely cured by the previously described method. Figure 4-B shows a nine-year cure in the left tonsillar and posterior buccal area by the same method.

2. To the tongue interstitial radium therapy plus intra-oral x-rays with a cone with external x-ray therapy to the submaxillary region was used (in the same dosage as previously described). Figures 4-C and D show a before-and-after picture of a cured squamous-cell cancer on the left anterior one-half of the tongue treated by the method described. Lesions on the posterior surface of the tongue which are difficult to reach with adequate homogeneous dosage of interstitial needles are treated, in addition to the interstitial needles, with intra-oral x-rays and a radium mold or "sucker."

3. The floor of the mouth is a very difficult area in which to space the interstitial radium needles properly and thus obtain a homogeneous dosage of gamma radiation. Thus, a mold or "sucker" of gamma radium is prepared to give an additional 2000 r. of gamma radium to this location. Intra-oral x-rays are added and both submaxillary regions are included in the external x-ray therapy. Care is taken not to overlap with too high a total dosage of x-rays in one given area when coned treatment is combined with external x-rays.

4. The gingiva: Interstitial radium needles are implanted on each side of the gingiva 1.5 cm. to 2 cm. apart, the surface of the growth is treated with an additional 2000 r. of external gamma radiation in the form of a mold, plus 3000 r. with intra- oral cone 2 cm. to 3 cm. in diameter, plus 2400 r. external x-rays to the gland-bearing areas.

Briefly, in summary, the dosages used successfully have been:

Gamma roentgens with interstitial radium needles 6000 r. to 8000 r. If the interstitial radium is not homogeneously distributed then gamma roentgens with intra-oral mold or "suckers" of 2000 r. are added, plus an intra-oral cone of x-rays, HVL 1 mm ca., 170 kv., 2000 r. to 3000 r.; plus external irradiation to the glands to a 6×8 cm. field kv., a total dose of 2400 r. to one field or, if crossfired, 1200 r. to each side of the neck. All x-ray dosage is given in divided doses over a ten-day period. The interstitial needles are filtered with 0.5 mm. platinum with distribution of 1 mg. per 1 cm. of active length of needle. They are spaced 1 cm. apart in tandem. In some areas in the oral cavity it is impossible to space the needles accurately and thus added gamma roentgens are delivered by external radium at 0.5 cm. to 1 cm. distance on an applicator. This is composed of two tongue blades taped together with 10 to 25 mg. of radium filtered with 1 mm. platinum distributed homogeneously at one end, covered with 0.5 cm. gauze and sealed with adhesive rubber and applied by the patient at home for two to three hours daily for a total dosage of 2000 r. These applicators are prepared and routinely tested by the Siemen's gamma roentgen dosimeter so an accurate dosage can be planned for each patient.

Table III shows a summary of methods used in the fifty-four patients studied; nineteen patients received interstitial needles plus coned x-rays and external x-rays to the gland-bearing areas; twelve patients received interstitial radium needles plus intra-oral radium "suckers" plus coned and external radiation to the submaxillary regions.

Of the fourteen patients who died of oral cancer, only four had had radiation by interstitial radium element needles (Table V). Two of these patients treated with interstitial radium were clinically well for five years after treatment, but had a new growth in another location in the mouth which was

TABLE V. SUMMARY OF METASTATIC DEATHS FROM ORAL CANCER

Sex	Average Age	Location		Syphilis	Metastatic Nodes on 1st Exam Size of Lesion		Biopsy		Metastatic Lesion at Death	
9 males	74	Left tonsilar	1	Wasserman (++++)[1]	P_1N_0	6	Refused	9	N_1	6
5 females		Gingival and roof of mouth	2		P_1N_1	4	Sq. cell Grade I	2	N_2	7
		Floor of mouth	4		P_1N_2	2	Sq. cell Grade II	2	N_3	
		Entire right of tongue and floor of mouth	1		P_3N_0	1	Sq. cell Grade IV	1	N_4	10
		Gingiva	2		P_3N_2	1				
		Tongue	4							

PREVIOUS CURE OF OTHER ORAL CANCERS IN THE SAME PATIENT

Case 15: Female Tongue Anterior: 1/3 cured P_1N_0 three years with radiation. Died with N_1—cancer junction of tongue and right pillar.

Case 21: Female Right Gingiva: P_1N_0 looked cured two years with radiation. P_1N_0 lived four years longer with surgery and radiation.

Case 40: Male Floor of Mouth: P_1N_0 cured with radiation five years, then P_1N_1 right side of tongue . . . Fatal.

Case 54: Male Left Tongue Luetic Leukokeratoses: Previous cures for oral cancer four years; with third cancer right tongue P_1N_1, radiation of the tongue cancer failed. Died with metastasis.

not cured by irradiation. The other ten patients were treated in conjunction with other physicians, and other methods, such as surgery and radon seed implantations, had been used first before the patients were seen by us. The size and location of the lesion made interstitial needles an impossibility in eight patients.

Our results of treatment are excellent. This encourages us to continue treatment in the oral cavity as we have been taught by our predecessors and by our own experience. Two cases showed a three-year and four-year cure respectively but died of other causes; thirty-seven patients were cured for five years or more with a five-year cure rate of 68.3 per cent.

Death from Oral Cancer

Death from oral cancer was recorded for fourteen patients. Table V gives a summary of these deaths. Nine patients were men and five patients were women. The average age was seventy-four years. In four patients cancer was located in the floor of the mouth, and in four patients it was on the tongue. These two locations have had the worst prognosis in our experience. The cancers involving the intra-dental line and the lateral buccal cavity did not produce a single death. One patient had syphilis with severe lingual leukoplakia and leukokeratosis. Seven patients out of the fourteen (50 per cent) that died with oral cancer failed to show any metastatic nodes (N_0) on palpation at the first examination of the lesion; four patients had one single unilateral node 2 cm. or less in size (N_1); three patients showed multiple unilateral nodes or one large, movable node more than 2 cm. in size (N_2). The size of the lesions in eleven cases (P_1) was less than 3 cm.; two patients were P_3, above 5 cm. in size.

Nine patients of the fourteen cancer deaths refused biopsy. The biopsies performed showed two patients with Grade I squamous cell lesions; two with Grade II squamous cell pathological reports, and one had grade IV squamous cell, carcinoma.

Six patients showed N_1 or a single node 2 cm. at death. Seven patients showed N_2 one large, unilateral node above 2 cm. in size, or multiple unilateral nodes. One patient showed N_3 bilateral nodes, and ten patients were reported with distant metastases before death (N_4).

Four patients finally died from another oral cancer after the original cancer was cured. These are shown in Table IV. One woman (Case 15), aged seventy-eight years, had a lesion on the anterior tongue which was arrested for three years with irradiation but died with a new cancer at the junction of the tongue and the right pillar.

The second case (Case 21), a woman, aged sixty-five, had a lesion on the right gingiva P_1 N_0, looked apparently well for two years following radiation, but had a new lesion in close proximity to the old one with metastasis P_1 N_1; however she lived another four years with conservative surgery plus radiation.

A third case (Case 40), a man aged seventy-eight, entirely recovered for five years by radiation to a lesion P_1N_0 in the floor of the mouth, only to develop a new lesion on the right side of the tongue (P_1 N_1) with a metastatic node. He died after palliation irradiation.

A fourth case (Case 54, Fig. 3-B), a man aged seventy-six, with a positive Wassermann, a history

of treatment with arsenicals and a deep leukokeratosis over the entire surface of the tongue, developed two cancers: one on the tip of the tongue which was cured with interstitial needles, and two years later another one in the center of the tongue which was cured by the same process for two more years. Then, after four years of apparent recovery from interstitial irradiation, a third cancer developed on the right side of the tongue. Because he was older and had less physical strength to endure the pain from another course of irradiation he went to a large cancer center which is not approved by the medical profession where he was treated for nine months with pills and tonics. He then returned to us. His lesion on the tongue was 2.5 cm. in size and a 2 cm. node in the right submaxillary area could be palpated. In spite of further radiation therapy to his tongue and the node he died.

A final case should be reported briefly to show that even a large metastatic node can be cured by external or interstitial irradiation. Case 12, a man aged sixty, had a large lesion P_2N_0 on the tongue. He was treated by interstitial radium needles, coned x-rays to the tongue, and x-rays to the submaxillary region. The lesion had been noticed for a year and involved almost the entire left half of the tongue. The patient had had leukoplakia on his tongue for fifteen years, had been a pipe smoker for thirty years, and had consumed alcohol to excess, until two years prior to his treatments. His serum showed a positive Wassermann reaction and he had received several years' antileutic therapy. All of these etiologic factors combined to make his prognosis for cure about 3 per cent, that is, excessive alcohol, syphilis and pipe smoking. However, he was an excellent patient and in six months his tongue lesion was entirely cured, but he developed a hard, indurated node in the left submaxillary region which was diagnosed clinically by us and by the surgeon as a metastasis from the original cancer. He refused surgery and received 2400 r. of x-rays with small fields to the lesion every six months for two consecutive times. The node gradually disappeared, he is still entirely well, and is being reported as a ten-year cure (1949 to 1959).

Conclusion

1. Twenty years of experience with the use of irradiation in cancer of the oral cavity are reported.

2. In a careful study of fifty-four cases of oral cancer (1949 to 1959), the results of treatment are tabulated.

3. Thirty-seven cases are reported as five-year cures; one a three-year cure, and one a four-year cure. This gave a five-year cure rate of 68.3 per cent.

4. In fourteen cases, the patients died with oral cancer and were the subject of discussion as to the method of treatment they received, the presence of palpable nodes on first examination, and other pertinent facts concerning these fatal cases.

Bibliography

1. Lamb, J. H.: Role of a dermatologist in therapy of cancer of the skin. J.A.M.A., 153:1509, 1953.
2. Gardham, A. J.: The classification of buccal neoplasms in relation to treatment and prognosis. Lancet, 1:677, 1939.
3. Michelson, H. E.: Die Leukoplakie, der Hautarzt, 10 Jahrgang I Heft., S-1-2. Jan., 1959.
4. Ormsby, O. S., and Montgomery, H.: Diseases of the Skin. p. 808. Philadelphia: Lea & Febiger, 1948.
5. Cipollaro, A. C., and Foster, P. D.: Bowen's precancerous dermatosis of the mucous membrane. New York State J. Med., 40:264, 1940.
6. Ackerman, L. V.: Verrucous carcinoma of oral cavity. Surgery, 23:670, 1948.
7. Jillson, O.: Diagnosis and treatment of misdiagnosed dermatoses. J.A.M.A., 166:600, 1958.
8. Report of the International Committee on Presentation of Results. 7th International Congress of Radiology, July 1953. Acta Radiologica, Supplement, 116:712, 1954.
9. MacComb, Wm. S., and Fletcher, G. H.: Symposium on Oral Cancer. M. D. Anderson Hospital, Houston, Texas. (To be published).
10. Lamb, J. H., and Eastland, W. E.: Cancer of the lower lip. J.A.M.A., 114:600, 1941.
11. Lain, E. S.: Problem of electrogalvanism in the oral cavity caused by dissimilar metals. J. Am. Dent. A., 27:1765, 1940.
12. Lain, E. S.: Chemical and electrolytic lesions of the mouth caused by artificial dentures. Arch. Dermat. Syph., 25:21, 1932.
13. Lain, E. S.: Lesions of the oral cavity caused by physical and by physio-chemical factor. Arch. Dermat. Syph., 41:295, 1940.
14. Lain, E. S.: Electrogalvanic lesions of the oral cavity produced by metallic dentures. J.A.M.A., 100:717, 1933.
15. Lain, E. S.: Electric phenomena in the oral cavity. Dent. Digest, 40:214, 1934.
16. Burkett, L. W.: Oral medicine. Philadelphia: J. B. Lippencott Co., 34, 1946.
17. Lain, E. S., and Roland, Marion: Personal Communications.
18. Quick, D.: Clinical Therapeutic Radiology. U. V. Portman, Editor. New York: Thos. Nelson and Sons, 128, 1950.
19. Quimby, E. H., and Pack, G. T.: Further studies on the skin erythemas with combinations of two types of radiation. Radiology, 15:30, 1930.
20. Martin, C. L., and Martin, J. A.: Treatment of cancer of the floor of the mouth and its cervical metastases by irradiation. Southern M. J., 51:1017, 1958.

Warts and Nevi

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Warts from viral infections and nevi as neoplasia constitute the most common epithelial tumors from the cradle to the grave. Their classification, recognition, and appropriate common-sense management belong to every practicing physician. Dr. Ravits here has presented a comprehensive and concise discussion of this common but frequently stubborn skin condition.

WARTS OR verrucae are benign, usually small circumscribed tumors. Warts are infectious and probably caused by a filterable virus. Autoinoculation of warts is a commonplace observation, and transmission of warts from man to man may be observed frequently. Their course and evolution are highly unpredictable, and often spontaneous cures occur, as well as cure by suggestion and psychotherapy. Simple measures will cure most warts and radical approaches should be reserved for more resistant forms and special situations.

Because of their different sizes, location, and numbers, treatment of warts must be individualized. For this reason, it is best to approach this subject with a classification of the various types.

Verruca vulgaris, common wart, or the so-called "seed wart," is usually seen on the extremities, especially the fingers. These warts are single or multiple. Children are more commonly affected. Those that occur under the distal margin of the nail plate are known as subungual warts and those that occur on the nail fold are known as periungal warts. Electrodesiccation is probably the treatment of choice for verruca vulgaris providing they are not too numerous. This is usually done very simply under local procaine anesthesia. The destruction should not be too deep because a wart is an intraepidermal growth. It is better to err on the side of not completely removing the wart than to destroy too much tissue and produce unsightly scarring. Electrodesiccation usually cannot be done if the warts are too numerous, or if they are in the subungual or periungual location. Under such circumstances chemical cauterization works the best even though this method sometimes may seem to be slow, tedious and not too precise. There are many chemicals in use either alone or in different combinations. Some of them are: trichloracetic acid, saturated solution of silver nitrate, pure phenol, 40 per cent salicylic acid plaster, 10 per cent formalin solution, 10 per cent salicylic acid in flexible collodion, and 0.7 per cent cantharidin in acetone and collodion. Freezing with such physical agents as carbon dioxide snow, liquid oxygen, or liquid nitrogen is also employed.

Flat warts or verrucae planae are smooth, flat, but slightly elevated. They appear chiefly on the face, neck, arms, and dorsa of the hands. This type is more common in children and young women. Often they are difficult to distinguish from lightly pigmented nevi. These lesions are frequently responsive to suggestive psychotherapy, reinforced with a mild exfoliative lotion or ointment such as used in the treatment of acne. An effective preparation is 5 to 10 per cent salicylic acid in alcohol or in an ointment base. Oral bismuth or mercury protiodide daily is of value. If these methods fail, very light superficial electrodesiccation can be done. This must be performed most carefully to avoid producing residual scarring.

Verruca plantaris, or plantar wart, may be present as one isolated lesion, or many lesions, on one or both feet. Multiple contiguous plantar warts forming a patch with a granular surface is known as a mosaic wart. These are the most difficult to treat. For the small isolated plantar wart, a moderate dose of superficial x-ray therapy is most useful. For non-responsive and larger lesions, chemical cauterants are most valuable. The following chemicals either alone, or in various

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combinations, are applied to the warts only: resin of podophyllin, trichloroacetic acid, monochloroacetic acid, bichloroacetic acid, salicylic acid in plaster or collodion, concentrated silver nitrate, cantharidin in acetone and collodion, and formalin. One must be wary of painful reactions; medications must be applied under medical supervision. These methods are time consuming and slow; much patience and time are required. Injections of novocaine into the base of the wart have been advocated as a method of therapy. Physical agents such as carbon dioxide snow, liquid nitrogen, and liquid oxygen have their advocates. Electrodesiccation must be used here with extreme caution because of the slow healing and scarring which might occur. Surgical excision of plantar warts is the final choice of treatment after all avenues of treatment have been exhausted. This is due to the risk of painful scarring. Thus the large variety of treatments for plantar warts attests to the unsatisfacory response of most of them.

Verrucae accuminata, condylomata accuminata, or moist warts occur in the moist intertriginous areas chiefly the anogenital area. Podophyllin is the treatment of choice. It is incorporated in either a 20 per cent solution in alcohol or tincture of benzoin. Treatment of painting medication on the lesion is performed every week until the wart is gone. Painful reactions should be watched for. In occasional instances of large condylomata, electrosurgery or other surgical measures are undertaken.

Pigmented nevus or common mole is one of the most common of all tumors. These nevi are not present at birth, but characteristically develop during infancy and childhood. A small percentage appear in adult life, and the vast majority of nevi are benign. Pigmented nevi usually begin as pigmented macules, but after months or years, they may become elevated and develop a variety of surface characteristics. The simplest way to classify nevi is by microscopic examination to determine the location of nevus cells in the skin. The flat macular lesions are of two types: (1) lesions showing increased deposition of melanin and a greater number of menalocytes at the epidermodermal junction, termed lentigo, and (2) lesions showing clumps or aggregations of nevus cells apparently being extruded from the epidermodermal junction into the underlying dermis known as junction nevus. A junction nevus is flat, smooth, dark, and hairless. It should be excised as it is thought to be a forerunner of malignant melanoma. A very, very small percentage of junction nevi become malignant. They may occur anywhere on the body but most commonly on the penis, palms and soles.

The intradermal nevus histologically shows the nevus cells to be aggregated entirely within the dermis. Clinically this is the so-called common mole which is flesh to dark brown in color, elevated, smooth, verrucous, or papillomatous. Hair is often present in these nevi and they are often seen about the face. These almost never become malignant.

The compound nevus resembles the intradermal or junction nevus and microscopically there are cords or nests of nevus cells in the dermis as well as at the epidermodermal junction. These are much more common in childhood and adolescence. It is very rare for a melanoma to arise from a compound nevus.

There are many reasons for removing nevi. Many are removed for cosmetic appearance. Most junction nevi should be removed prophylactically. However, they cannot be accurately evaluated without histological examination and we often have to rely on certain useful clinical guides. The following indications for prophylactic removal should be adhered to: (1) flat nevi in adults in which there is a color change, especially a redistribution of color so that it is speckled in appearance; (2) any nevus showing increase in size or contour; (3) any nevus showing ulceration, bleeding or crusting; (4) nevi located on genitals, hands, feet and mucous membrane; (5) when a nevus on any portion of the skin is subjected to repeated trauma.

The most effective useful and safe method for removal of nevi is simple surgical excision. Microscopic examination of excised tissue should be routinely performed. Radical wide excision of a benign lesion should not be done. A margin of 2 to 3 mm. of surrounding skin is usually adequate. If malignant change is found on microscopic study, radical excision should be undertaken.

Pedunculated, dome shaped or sessile lesions may be excised by curved scissors and the base cauterized by electrocautery. This heals leaving a nice cosmetic result, and a biopsy specimen is also preserved.

Blue nevus, epidermal nevus, and juvenile melanomas which are all benign lesions should probably be excised simply for prophylactic reasons especially if any aforementioned change occurs.

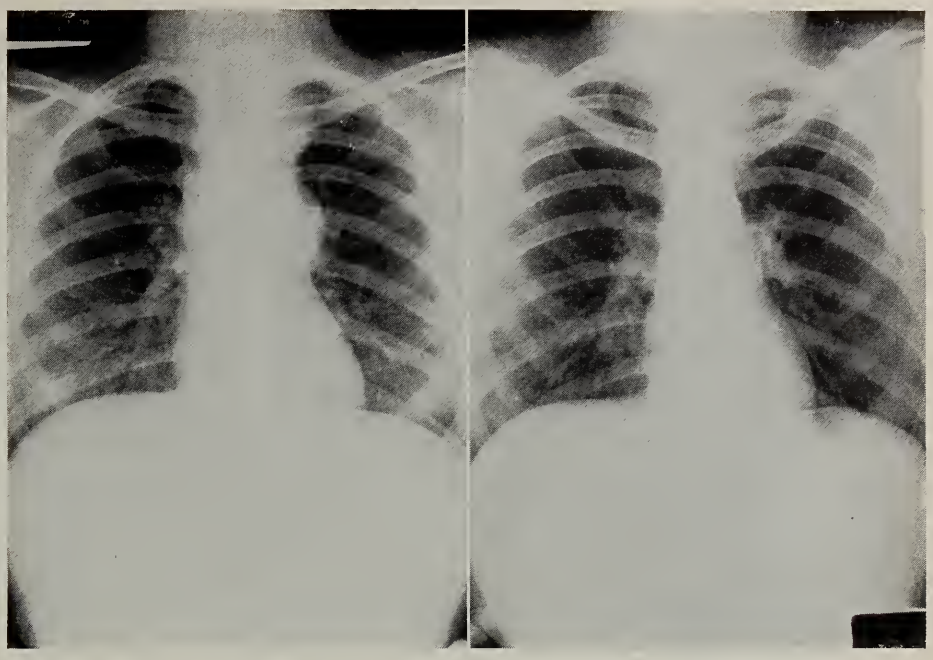


Fig. 1. (a) Admission chest radiograph shows massive adenopathy overlying the hila and extending cephalad along the mediastinal route to the level of the thoracic inlet. (b) Post therapy radiograph showing a normal mediastinal configuration.

Dysgerminoma of the Ovary

Unusual Roentgen Manifestation of Metastases

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IN SPITE OF the fact that dysgerminoma of the ovary is known to all practitioners of medicine, the report, heretofore unrecorded, of a case with bizarre metastases from such a neoplasm is considered worthy of publication.

Dysgerminoma of the ovary is a rare lesion comprising approximately three per cent of primary ovarian malignancies.[1-4] The lesion can occur at any age, but is found most frequently in the second to third decades.

The lesion apparently originates from the anlage of gonadal cells before specific sex characteristics have developed.[1,2,5,6,7,8] The right ovary is more frequently the site of origin than the left. Bilateral involvement is not a rarity.[3,9] Metastases are primarily spread in a retrograde fashion via the lymphatic route.

Micropsy shows a lesion made up of round cells, with large deep staining nuclei and clear cytoplasm, which lie discreetly apart in an avascular stroma. The connective tissue trabeculae are diffusely infiltrated with lymphocytes.[4,6,7]

The cure rate has been reported to vary from 27.5 to 66 per cent.[2,3,4,9]

The purpose of this report is to summarize a case which exhibited heretofore unreported soft tissue, adjacent calvarial, and long bone metastases.

The patient also exhibited the more usual metastases.

Case Report

When first seen, the patient was seventeen years old and complained only about her enlarging neck. She was completely unconcerned about her abdominal enlargement which approached the size of a full term pregnancy. Her physical examination showed a large mass rising centrally from the pelvis and which extended to the subxiphoid level. It was smoothly marginated. The other positive physical finding was that of the classical "bull neck" described in Hodgkin's disease. Her admission chest examination (Fig. 1a.) showed massive superior mediastinal adenopathy. Her "normal" white blood cell counts were in the 3-4000 range. Her hemoglobin never rose above 9-11 Gm. Her bone marrow showed depression but no other abnormalities. In retrospect, she admitted she had never menstruated.

Radiographs showed the above mentioned mediastinal adenopathy (Fig. 1a.) and a pelvic mass with secondary evidence of retroperitoneal adenopathy manifested by ureteral displacement on her excretory urogram (Fig. 2).

The pelvic mass was surgically removed to facilitate radiation therapy, for the node biopsy showed dysgerminoma. The pelvic primary showed the same histology.



Fig. 2. Intermediate excretory urogram shows soft tissue mass arising from pelvis to L4 level with secondary moderate hydronephrosis to compression of distal ureters. In addition there is left ureteral compression and lateral displacement associated with tortuosity due to periaortic nodes. Note: this disappeared after surgery and irradiation.



Fig. 3. Pleural and subpleural metastases especially in left hemithorax, but they are also present in upper and mid lateral aspects of right chest.

Radiation with an HVL of 2.8 mm. Cu. was administered to the pelvis, periaortic bed, mediastinum, and cervical regions. The tissue dose varied between 600 r and 1000 r. The course of treatment was regulated by her white blood cell count which fell to the 1000 range and her hemoglobin which dropped to 3-4 grams. No masses were palpable after treatment. Her chest returned to normal (Fig. 1b.).

The patient was able to carry on a normal life during the next two and three quarter years in spite of multiple metastatic recurrences which were treated. She had a subcutaneous metastasis to the mastoid tip. Later she returned with pleural and subpleural metastases (Fig. 3.). During the last year she developed a large scalp mass and underlying fronto-parietal lytic and proliferative osseous metastasis (Fig. 4a., 4b.). There was a "sun-ray" type of new bone formation in this region. In addition she developed what looked like generalized facial edema. This too repre-

sented subcutaneous metastases. All of these responded to minimal doses of irradiation. Her last visits were because of a painful right hip which was actually due to a pathologic fracture through a generalized bone change involving pelvis, hips and femora. These zones showed marked demineralization, accentuation of the primary trabeculae, bowing of the femoral necks, and broadening of

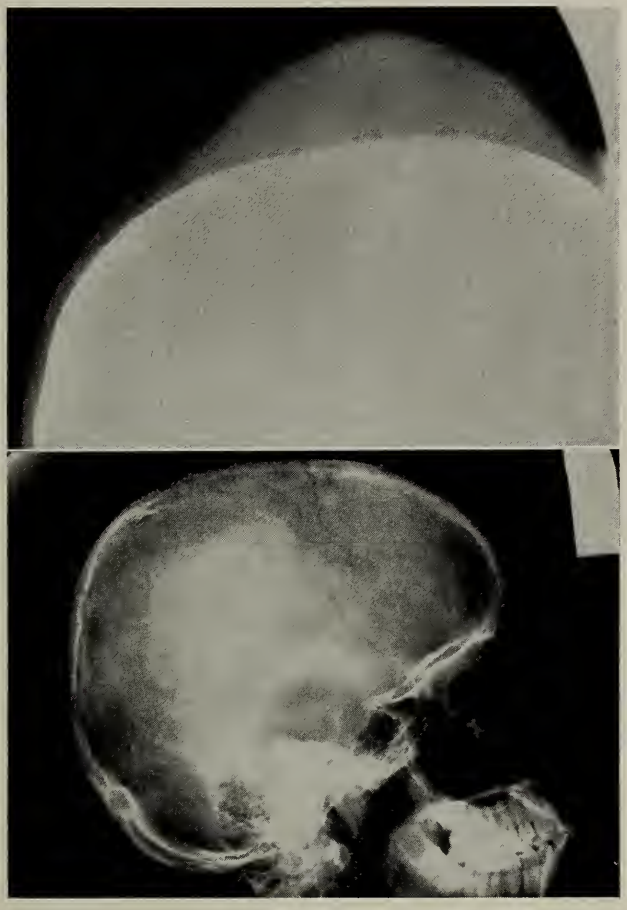


Fig. 4. (a) Soft tissue study of large scalp metastasis overlying the frontoparietal area. Note "sun-ray" new bone formation arising from the outer table of the cranial vault. (b) Routine skull projection showing bone resorption due to either true lysis or due to vascularity of tumor with secondary resorption.

the femora with some periosteal proliferation. The bone changes were pagetoid in appearance (Fig. 5.). She was treated with TEPA but did not respond.

Summary

The patient was a girl who was seventeen when first seen at which time she had a large pelvic dysgerminoma with periaortic, mediastinal, and cervical node involvement. The unusual features were the subcutaneous metastases which had the clinical appearance of edema. Her cranial vault lesion showed "sun-ray" changes. The pelvic and femoral findings were the most striking, for they had the appearance of advanced Paget's disease.

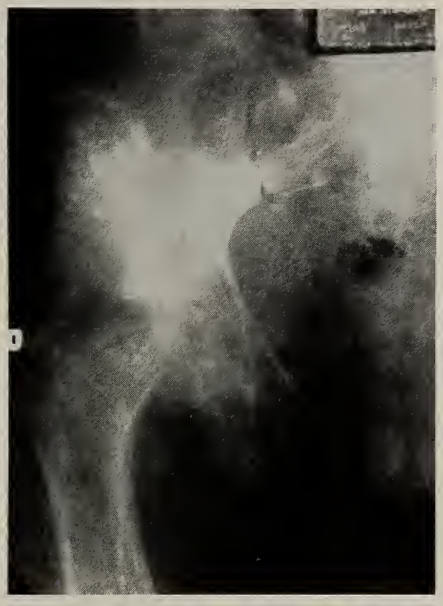


Fig. 5. Radiograph of right hip shows old impacted femoral neck fracture which is barely visible due to marked demineralization of the entire skeleton, especially pelvis and lower extremities. The most interesting feature is coarsening of primary trabeculae of bones, primarily of femora, with bilateral femoral neck bowing, pagetoid changes.

Bibliography

1. Cowan, I. I., and Feld, S. M.: Dysgerminoma of the ovary. A review of the literature and a report of two additional cases. Am. J. Obst. & Gynec., 66:668 (Sept.) 1953.
2. Custer, W. C.: Dysgerminoma of the ovary. Surgery, 20:520 (Oct.) 1946.
3. Mueller, C. W., Topkins, P., and Lapp, W. A.: Dysgerminoma of the ovary: An analysis of 427 cases. Am. J. Obst. & Gynec., 60:153, 1950.
4. Nystrom, Clinton: Dysgerminoma of the ovary. Acta Obst. et Gynec. scandinav., 35: Fasc. 3, 385, 1956.
5. Dockerty, M. B., and MacCarty, Wm. C.: Dysgerminoma, with a report of nine cases one associated with pregnancy. Am. J. Obst. & Gynec., 37: 878, 1939.
6. Greenblatt, R. B., and Pund, E. R.: Dysgerminoma ovarii, Am. J. Obst. & Gynec., 35:667, 1938.
7. Meyer, R.: The pathology of some specific ovarian tumors and their relationship to sex characteristics. Am. J. Obst. & Gynec., 22:697, 1931
8. Novak, B., and Gray, L. A.: Dysgerminoma of the ovary: Clinical and pathologic study of 17 cases. Am. J. Obst. & Gynec., 35:925, 1938.
9. Pedowitz, P., Felmus, L. B., and Grayzel, D. M.: Dysgerminoma of the ovary, prognosis and treatment. Am. J. of Obst. & Gynec., 70:1284, 1955.

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Birth Weight Disparity

A report on three sets of twins with marked weight disparity. The literature is reviewed and the authors discuss the possible etiology of this condition.

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Presented upon invitation by Doctor Augenbaugh at the meeting of the Minnesota Obstetrical and Gynecological Society, Minneapolis, Minnesota, November 29, 1958.

WITHIN a two-month period in the spring of 1957, Larson et al delivered three sets of twins which exhibited a marked disparity in birth weights. This disparity prompted us to search the literature in an effort to find out if there is a reasonable explanation for such a marked discrepancy in birth weights. This paper will consist of case reports of our cases along with some of the pertinent information found in the literature. We will include a few remarks about twinning in general.

Twinning has long been the object of special interest to lay persons and physicians alike, and the subject of many fanciful tales repeated by generations down through the ages. More recently, identical twins have been used in studies attempting to assess the relative contribution of heredity and environment to the development of the individual.

Twins are either monozygotic or dizygotic and twinning occurs approximately once in each eighty-nine births. Interestingly, the incidence of triplets is once in each 89^2 births and that of quadruplets once in each 89^3 births.[1] In general, about three-eighths of twin births consist of a male and a female infant. These sets are always dizygotic twins. Assuming that these represent approximately one-half of all dizygotic twin pairs, one could postulate that dizygotic twins make up six-eighths or three-quarters of all twin pairs and monozygotic twins the other one-fourth.

Two methods of diagnosing twinning with respect to zygotic origin have been widely used. These are the fetal membrane method and the similarities method. The former assumes that all monozygotic twins are monochorionic and that all dizygotic twins are dichorionic, and that careful microscopic study of the membranes will lead to a correct estimate of zygotic origin even if, as sometimes occurs, the two chorions are tightly fused.

The similarities method consists of comparison at a later date of such characteristics as physical appearance, blood types, eye color and fingerprints. When the two systems are compared retrospectively using the same subjects, one finds that they agree perfectly in cases in which the children are markedly dissimilar. However, in cases in which the children appear to be identical twins when measured by the similarities method, there is no agreement at all. Some authors feel that this is evidence that occasionally monozygotic twins have double chorions possibly due to twinning prior to the trophoblast stage. If this were so, then one could be certain of zygotic origin at the time of birth only in those cases in which a single chorion is present.[1,2]

Case Reports

Case 1.—A twenty-two-year-old Rh positive gravida 1 following a forty-week pregancy during which she had third trimester albuminuria ranging from one plus to four plus with a maximum blood pressure of 130/90, delivered a 6 pound 3 ounce living girl and a 3 pound 9 ounce living girl infant. The difference in birth weights was 2 pounds 10 ounces. The placenta grossly was of normal size with one cord inserted at the junction of the two amniotic sacs and the other in an eccentric position. Histologic examination of the placental membranes revealed the presence of a single chorion.

The smaller infant lived only three days. At autopsy the internal organs were found to be well developed and the lungs atelectatic. Microscopic examination of the organs revealed minimal hematopoiesis in the liver

and marked atrophy of, and hemorrhage into, the adrenal glands.

Case 2.—A thirty-one-year-old Rh positive gravida 3 para 2, following a thirty-six-week normal pregnancy with spontaneous onset of labor, delivered a 6 pound 6 ounce living boy and a 2 pound 7 ounce macerated stillborn infant. The difference in birth weights was 3 pounds 15 ounces. The placenta was markedly reduced in size and was grossly monochorial. Microscopic examination of the placenta was not performed.

At autopsy the stillborn infant was found to be macerated, poorly developed and poorly nourished. The abdominal wall was perforated, and a sizable segment of necrotic small bowel had herniated through onto the anterior abdominal surface. The internal organs were markedly necrotic and partially liquefield. Dissection and weighing of organs was not carried out.

Case 3.—A twenty-six-year-old Rh positive gravida 1, following a forty-week normal pregnancy, delivered a 6 pound 4 ounce living girl and a 3 pound 12 ounce living boy infant. The placentos were separate and were normal in appearance.

The smaller twin lived only one hour. Gross examination at autopsy revealed atelectasis, clubbing of the right foot, complete absence of kidneys, thrombosis of cerebral veins with encephalomalacia and calcification, and an area of subendocardial fibrosis. Microscopically the liver showed minimal hematopoiesis. Agglutination tests done on the mother were negative for toxoplasmosis.

When large numbers of infants are compared with respect to their birth weights, it can be shown that single fetuses weigh approximately 650 grams more than twin fetuses. This difference is due to a differential growth rate between twenty-seven and thirty-six weeks gestation. Physiological differences also exist in the birth weights of members of a twin pair, and are affected by differences in the duration of pregnancy, sex and zygosity. Dizygous male infants which are products of a full term pregancy tending to be larger. This average weight difference between twins is 400 to 500 grams.[3]

Brody reported four cases similar to ours, in three of which marginal insertion of the cord was found, and in one of which vellamentous insertion of the cord was present. He feels that the increased pressure on the placental vascular bed near term reduces nutriment to the fetus and that this reduction may be significant in twin pregnancies, where it occurs earlier. He also believes that this increased pressure has a more detrimental effect upon an infant whose cord is inserted at the thinner periphery of the placenta than on one whose cord is inserted at the thicker central portion. On the other hand, Eastman and Greenhill state that marginal insertion of the cord has no clinical significance.[4]

In monozygotic twins, when the two members of the pair begin to invade the common placenta with their blood vessels, they tend to divide the placental area somewhat equally. An extensive capillary anastomosis occurs between the two portions of the placenta. However, occasionally, in addition to capillary anastomoses, there occurs extensive anastomosis of artery to artery and vein to vein. Whenever there are anastomoses of this sort, much of the welfare of the twins depends upon whether such unions are symmetrical or asymmetrical. A symmetrical situation involves a fair and even exchange of blood between twins and all is well with both. But if there is an imbalance, one twin may progressively lose blood while the other progressively gains blood. Often the twin who loses blood dies and the circulation of both twins continues for awhile through the labor of the surviving twin, whose heart enlarges to meet the extra work load.[1,2]

Most authors agree that superfetation in a human has so far not been proved, although it has been well demonstrated in animals.[1] As you may recall, the living infants in our series upon whom autopsy was later performed had reached a state of development compatible with a full term pregnancy, a fact which would cast doubt upon superfetation as an etiological factor in these cases.

In summary, this paper has reviewed the case histories of three sets of twins showing marked differences in birth weight and has discussed several possible etiological factors.

Acknowledgment

The authors wish to acknowledge the use of material from the case studies of Drs. Paul N. Larson, Edgar G. Ingalls, Morris S. Rothnem, and Gunard A. Nelson.

References

1. Eastman, N. J.: Williams Obstetrics. New York: Appleton-Century-Crofts, Inc., pp. 659-660, 663, 1956.
2. Newman, H. H., Freeman, F. N., and Holzinger, K. J.: Twins: A Study in Heredity and Environment. Chicago: University of Chicago Press, pp. 32-39, 1937.
3. Guttmacher, A. F., and Kohl, S. G.: The fetus of multiple gestations. Obst. & Gynec., 12:528-541 (Nov.) 1958.
4. Brody, S.: Variation in size and weight of twins of monochorial pregnancies. Am. J. Obst. & Gynec., 64:340-346 (Aug.) 1952.

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Insect-Borne and Animal-Borne Virus Diseases of Man

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IN RECENT years, in countries outside the United States many new viruses which cause disease in human beings have been isolated from wild animals, and the geographic range of some viruses already known has been found to be greater than previously suspected. Although the situation has not changed appreciably in the United States within recent years, American travelers may encounter some of the newly recognized agents in other countries. The study of viruses isolated from wild animals, their maintenance in nature, and the diseases caused by them, has begun to comprise a field all its own.

The isolation and study of viruses from domestic animals has disclosed some interesting interrelationships with viruses considered to be limited strictly to human beings.[1-4] Fowl plague virus and two virus strains, one from sick ducks and the other from horses, isolated in Czechoslovakia, have been shown to be related to influenza A virus strains isolated from human beings. Andrewes[1] believes that the recent outbreak of the Asian type of influenza may have had its origin in some animal species in China. Recently it has been shown that a virus isolated from calves with shipping fever is related to the so-called hemadsorption virus I or para-influenza virus 3 isolated from children with respiratory illnesses. The virus of dog distemper shows a relationship to that of measles. In most of these instances, it is probably a case of viruses having a common origin some time in the past rather than of one virus strain affecting both animals and man.

The incidence of known virus disease acquired from animals in the United States is not great and varies widely from year to year. Tick transmitted virus diseases tend to be endemic; each tick season regularly produces its annual quota of disease. Mosquito transmitted virus diseases tend to be erratic in occurrence and may be of little importance for many years and then occur in epidemic form. The most common methods of infection are by arthropod vectors such as ticks or mosquitoes or by the respiratory route. Other methods are by bite of animals as in rabies, scratch in cat scratch fever or contact as in milkers' nodules.

A complete survey of this field would be a suitable subject for a symposium. I will confine my discussion to a small number of diseases which for various reasons have interested me. A short discussion of Q fever will also be included. This is because rickettsial diseases are usually considered with virus diseases, their reservoir is in animals and essentially the same technics are used for their study both in the laboratory and the field.

Mosquito-Transmitted Encephalitis[5]

Three of these diseases are recognized in North America. As far as is known, only two need be considered in the Midwest; that due to the Western equine encephalomyelitis virus and that due to the St. Louis encephalitis virus. The Eastern equine encephalomyelitis (EEE) virus has caused disease among horses primarily along the Atlantic and Gulf Coasts of the United States. In the interior of the country there have been outbreaks of EEE described in Ontario and Michigan and sporadic cases in Wisconsin, Missouri and Tennessee. Human disease has been recognized in Massachusetts, Louisiana, New Jersey and Texas. At the Rocky Mountain Laboratory, we have never

found any evidence of the presence of EEE virus in North Dakota, and it appears unlikely that it is any problem in Minnesota.

Encephalitis due to the *Western equine encephalomyelitis (WEE) virus.*—Encephalitis occurring simultaneously in people and in horses during the summer months in the western United States is almost certainly due to this virus. Outbreaks occur at irregular and unpredictable intervals. 1935 through 1938 were years with a high incidence of disease among horses. Disease in human beings began to be recognized in 1937. In 1941, a very severe outbreak involving particularly the states of North Dakota, Montana, and Minnesota occurred. Since that time there have been no severe outbreaks although it is a rare summer when no human cases are detected. The summers of 1947, 1949, 1953, and 1954 showed some increase in incidence in eastern Montana, North Dakota and adjacent Minnesota.

Whenever this disease occurs, there is an abundant *Culex tarsalis* population and WEE virus is readily isolated from this mosquito species, which has been established definitely as the only important vector. Present evidence indicates that a cycle of infection between *C. tarsalis* and wild and domestic birds is an important mechanism for maintaining the virus during the summer months. This mosquito commonly feeds on birds; WEE virus has been isolated from bird blood and antibodies against this virus have been found frequently in bird sera. In the laboratory, experimentally infected birds have a high titer of virus for a few days and can readily infect *C. tarsalis*. There is no evidence that the horse, or other large domestic animals, plays any role in spreading the virus.

How the virus is maintained from year to year in areas such as the northern United States where the winters are cold is not known. It has been suggested that the virus is introduced each spring as a latent infection in migrating birds; also, that hibernating *C. tarsalis* may carry virus through the winter. There is no substantial evidence for either hypothesis and there may be some mechanism for virus maintenance independent of both bird and mosquito.

Control in the horse population is simple since there is an effective vaccine. With regard to the human population, the attack rate, except in the 1941 epidemic, has not been high enough to warrant advising vaccination as a method of control. Where the disease is endemic and the population dense, as in the central valley of California, mosquito control is used and helps to reduce the incidence. In other areas, it has generally been left to the individual to protect himself against mosquitoes, which is not as unsatisfactory a method as it may sound. Disease does not occur without an abundant *C. tarsalis* population. A marked increase in mosquito population appears some weeks before human disease and, if observation of the *C. tarsalis* population is maintained, it is possible to give warning of possible danger and advise use of all possible methods of protection against mosquito bite.

St. Louis Encephalitis (SLE).—In the northern plains area of the United States only sporadic cases of this type of encephalitis have occurred. Surveys show a low incidence of antibodies in sera of people living in Minnesota, North Dakota and Montana. In Idaho, about 20 per cent of sera have SLE antibodies and virus is rather frequently isolated from mosquitoes, but actual clinical disease appears to be infrequent.

In North Dakota, Idaho, eastern Washington and California, most isolations of the SLE virus are made from *C. tarsalis* and this appears to be the important vector. In Texas, epidemiological evidence and isolation of virus indicate that *Culex quinquefasciatus* may be the carrier and in the central United States epidemiological evidence indicates that *Culex pipiens* is the important vector. Virus has been isolated from this species in a number of areas. Maintenance of this virus is not as well understood as that of WEE. Since *C. tarsalis, C. quinquefasciatus,* and *C. pipiens* all feed on birds, and since antibodies have been found in bird sera, and virus has been isolated from wild birds, it has been thought that a mosquito-bird cycle may be important in maintenance. However, during the summers in which WEE virus is found frequently in *C. tarsalis* and when there is ample evidence of a bird-mosquito cycle, conditions are not particularly favorable for epidemics of SLE.

The occurrence of St. Louis virus does not have any relationship to that of the WEE virus; the opposite would be expected if its natural history were similar. SLE virus does not produce clinical disease in the horse although antibodies against this virus are found quite frequently in horse sera. Also, there is no epidemiological evidence to in-

dicate that horses or other large domestic animals play any role in disseminating SLE virus.

Methods of control other than mosquito control have not been devised; there is no vaccine.

Diagnosis of both Western equine and St. Louis types of encephalitis should be established by laboratory methods since there are other types of central nervous system disease with similar symptoms. The simplest and most useful technique is the complement fixation test for which acute and convalescent blood specimens are necessary. A four-fold rise in antibody titer is considered diagnostic.

Tick-Transmitted Virus Diseases

Colorado Tick Fever (CTF).[6]—This is the most common tick transmitted disease of man in the western United States and is the only tick transmitted virus disease recognized in North America.

All patients with this disease have had exposure to ticks within the range of *Dermacentor andersoni,* usually four to five days prior to the onset of their disease. This is the common spotted fever tick of the mountainous areas of the western United States.

The virus is isolated readily from adult ticks and has been found quite frequently in engorged larvae and nymphs and their small mammalian hosts. It is maintained by a cycle of infection between immature stages of the tick and their host animals.

Persons commonly affected by CTF are sheepmen, cattlemen, foresters, fishermen, tourists, and others whose occupational or recreational activities bring them in contact with ticks.

The disease often has such a typical clinical course that the diagnosis can be suspected. There is sudden onset with fever, chilly sensation or chills, low backache, headache, and general aching. These symptoms continue for two to three days and then recur for one to three days. A marked leucopenia is characteristic. Occasionally encephalitis or marked bleeding occurs, usually in children.

Diagnosis is most quickly established by isolation of the virus from blood by use of suckling mice. Complement fixing and neutralizing antibodies appear in three to four weeks.

Control at present is through avoidance of ticks and the use of tick repellents. Current attempts to make a vaccine appear promising.

Powassan Encephalitis.[7]—Recently McLean and Donohue reported isolation of a virus from the central nervous system of a boy dead of encephalitis at Toronto, September, 1958. His home was Powassan, Ontario, about 200 miles north of Toronto. This new virus was said to be related to that of Russian spring summer encephalitis (RSSE) as shown by hemagglutination inhibition and complement fixation tests. This aroused considerable interest since RSSE is an important tick transmitted disease in Russia, Poland, Czechoslovakia, Yugoslavia, Austria, Sweden and Finland. Goats also may be infected by tick bite, have fever for a few days, and excrete virus in the milk which is infective to people drinking it. In Scotland and the northern counties of England a similar tick transmitted virus causes Louping Ill of sheep and occasionally affects human beings. Another similar tick transmitted virus causes a hemorrhagic disease in parts of Russia and India.

At the Rocky Mountain Laboratory preliminary study indicates that any relationship of Powassan to the RSSE virus is quite slight and field study by Kohls of the Rocky Mountain Laboratory suggests that ticks may not be involved in transmission to man. However, some other arthropod, such as a mosquito, may be the vector, and study is necessary to determine the importance of this new virus as a cause of human disease in the United States and Canada.

Disease Spread by Contact

Cat Scratch Fever.[8]—This is a clinical and epidemiological entity, although no etiologic agent has been demonstrated. No organism has been cultured and no disease has been produced in the common laboratory animals nor changes observed in tissue culture. Cat scratch fever is generally considered to be a virus disease. Some patients show a low complement fixing titer with Lygranum antigen, and on this basis attempts have been made to classify this disease with the lymphogranuloma-psittacosis group; but the evidence presented hardly justifies this conclusion.

Although in other countries some cases have been reported to be associated with injuries by thorns and wood splinters, most of the cases reported from Canada and the United States have been associated with cats.

In about 50 per cent of the cases, a few days after a scratch or other skin injury, a small reddish nodule appears at the site. On top of this

a vesicle, pustule, or crust may appear. Four to thirty days after skin injury enlargement of a regional lymph node is noticed. At this time there are usually mild systemic symptoms consisting of fever, headache, general aching and lassitude. Lymph nodes are frequently described as being as large as golf balls. A lymph gland may break down and become filled with pus. The adenopathy generally lasts from two to six weeks. A striking form of the disease is oculo-glandular: a granulomatous lesion of the conjunctival surface of an eyelid with marked swelling of a preauricular lymph gland. The groups of glands most commonly involved are the epitrochlear, axillary, cervical and inguinal.

Occasionally a case of cat scratch fever is complicated by encephalitis, but, fortunately, no sequellae appear to result.

The histological picture found in a lymph node does not differ particularly from that in other granulomatous conditions. There is first hyperplasia of reticulum cells, then areas of necrosis bordered by epithelioid cells in a palisade arrangement with an occasional Langhan's type giant cell.

Diagnosis in suspected cases is established by a skin test using pus from a fluctuant node of a known case. The pus is inactivated by heating to 60° C for one hour on three successive days and is usually diluted 1:5 with saline.

The disease appears to occur wherever there are both cats and an interested person looking for the disease.

The role of the cat is generally considered to consist of passive transfer of an agent acquired from some bird or mammal on which cats prey. Cats do not give a positive skin test and autopsy of some that have transferred infection showed no lesions. With the great number of virus agents now being found in the intestinal tract of various animal species, it seems possible that cats will be shown to harbor a virus harmless to themselves but pathogenic to man.

Milkers' Nodules.[9,10]—Becker, in 1940, was the first to publish an account of this condition in the American literature. The disease appears to be relatively common in dairy areas of the United States. The etiologic agent is considered to be a virus but is not vaccinia. A person immune to vaccinia is not immune to this disease and a person who has had milkers' nodules is not immune to vaccinia.

A patient presents himself with a bluish dome-shaped lesion 1 to 1.5 cm. in diameter on finger, hand, wrist or face. The lesion starts as a small red papule which slowly increases in size, lasts four to six weeks and causes little discomfort. The patient usually milks cows and often has recently started to do so.

There is usually a history of lesions on cows' teats. They start as small papules which become pustular or crusted, then a granulating ulcer appears which takes about two weeks to heal. Our limited attempts to demonstrate the etiologic agent have been unsuccessful.

B Virus Encephalitis.[11-13]—In 1934, fatal ascending myelitis in a physician following bite of a rhesus monkey was reported. In 1949 a case of fatal encephalomyelitis in another physician followed possible contamination of a cut on a finger by saliva of a rhesus monkey. Both physicians were engaged in experimental work with monkeys and, since up to that time no great number of people were engaged in such work, the disease was not considered to be a serious medical problem. However, since production of poliomyelitis vaccine began, large numbers of monkeys have been imported and many people are exposed. Recently, in connection with production of vaccine, one death from encephalitis in Canada and three in the United States were reported. In three instances there was history of recent contact with monkeys but no recent bites; in the fourth case there was handling of monkey kidney cells and a history of a recent cut by a broken bottle containing cells. B virus frequently has been isolated by laboratories doing large amounts of monkey-kidney tissue culture work, so it is known that both rhesus and cynomolgus monkeys are frequent carriers of the agent. In these recent cases, except for the patient cut by glass, the route of infection is not clear.

The virus is classed as one of the herpes group but is distinct from herpes simplex virus of human beings.

Air-borne Spread

Psittacosis (Ornithosis).[14-19]—A virus first thought to be limited to psittacine birds has been shown to be one of a group of closely related viruses affecting a wide variety of birds and mam-

mals. In 1953, Bedson stated that at least seventy species of birds belonging to ten orders had been shown to harbor infection. Similar viruses found in mammalian species are the pneumonitis viruses of mice and hamsters, the meningopneumonitis virus possibly originating in the ferret, and the viruses of bovine enteritis, bovine encephalomyelitis, sheep pneumonitis, enzootic abortion of ewes and a paralytic disease of opossums. There are two published reports of mammalian strains of virus causing disease in human beings, both were laboratory acquired infections. One was due to the virus of enzootic abortion of ewes, the other to the virus of bovine encephalomyelitis. The clinical picture in these two infections did not differ essentially from those caused by avian strains. At the Rocky Mountain Laboratory, Lackman, using a psittacosis antigen, has found a complement fixation titer of 1:16 or higher in 46 per cent and 69 per cent respectively of the sera of two bands of sheep. A more usual rate is 8 per cent. In one group of sera from forty-two Idaho sheepherders, seven (16.7 per cent) had complement fixation titers of 1:16 or higher in comparison with 2.5 per cent in a large group of sera sent in for various diagnostic purposes. Whether the antibodies found in the sheepherders' sera are the result of exposure to psittacosis infection in sheep is at present unknown but the possibility needs investigation. The existence of human strains causing atypical pneumonia has been suggested occasionally where there was no known animal exposure and especially where there was case to case transfer of infection. With the recognition of members of this group of viruses in an ever increasing variety of animals, it is best to be cautious about postulating an atypical pneumonia agent of this group with man as the primary host.

Nature of these agents.—Their uniform susceptibility to the action of penicillin and the tetracyclines and of some strains to the sulfonamides sets them apart from the true viruses. They are usually classified midway between viruses and rickettsiae.

Terminology and classification.—Available data have not permitted a satisfactory grouping of these agents. Strains isolated from non-avian sources, with the exception of meningopneumonitis virus which may be an avian strain, have not been pathogenic for birds so that a rough separation into avian and non-avian strains may be possible. Avian strains, however, have differed markedly as to virulence for experimental animals, toxin production and reaction in cross toxin neutralization tests. Therefore, it is impossible from a study of a strain to classify it in relation to a particular avian source. Mammalian strains, although isolated from the same animal species, show differences in virulence for experimental animals and in serology. A systematic study of these agents, to find some method of classifying them, is badly needed. The terms used such as trachoma virus, the virus of enzootic abortion of ewes, or psittacosis virus are not likely to suggest to one unfamiliar with the field that a group of related agents is concerned and a more informative terminology is necessary.

Maintenance of these agents.—Although much is known about the maintenance of these agents in birds, in aviaries, and in domestic birds such as pigeons, ducks, chickens, and turkeys and their transfer from such birds to human beings, little is known about the maintenance of such viruses among wild birds and their possible transfer to man either directly or directly via domestic birds. The natural history of the mammalian viruses has not been intensively studied, but latent infections are known to occur with some of them.

Q Fever.[20-22]—Although Q fever rickettsiae have been isolated from several species of ticks, human disease is rarely, if ever, caused by tick bite. Q fever rickettsiae appear to have established a cycle of infection in cattle, goats and sheep which is independent of ticks. The placenta and birth fluids of infected animals contain a large number of rickettsiae. Since these organisms are very resistant to drying, air-borne spread to uninfected animals seems likely. Any human beings in the vicinity can also become infected. Q fever in people working with sheep is definitely related to lambing time. In people exposed to infected cattle, the exact route of infection is not quite so clear since calves are born throughout the year in dairy herds and milk, which also contains rickettsiae, is often used raw. In southern California, it was definitely shown that there was a risk associated with working in a dairy, living near a dairy and, apparently, drinking milk containing viable rickettsiae. This latter point is not quite so clear since the people drinking raw milk frequently worked in a dairy or lived near one. In

England, spread from cattle has been attributed mainly to drinking raw milk. In packing house outbreaks spread appears to be air borne, but the tissue that is the source of infection is not known. These outbreaks are unusual in that for years great numbers of cattle and sheep may be handled without any trouble, and then a sudden outbreak occurs. The disease has been reported among people handling wool and among laundry workers handling soiled clothes from a laboratory working on Q fever.

The epidemiology of this disease is far from clear. In reports of any large series of cases, there is always a large group that does not have occupational contact with cattle or sheep or their products and does not consume raw milk. Some of these cases are attributed to contact with people who do have contact with cattle or sheep, for example, cases in barbers, shopkeepers, or bartenders; others to air borne spread at quite a distance. If these observations are true, the number of rickettsiae necessary to infect a human being is very low.

A major problem in the epidemiology is the role of dairy cattle. Infection of dairy cattle is known to be present throughout most of Canada and the United States. What is the public health significance? Some data indicate that ingesting rickettsiae is not very apt to cause disease so that it is questionable whether consuming milk which contains rickettsiae plus antibodies is very dangerous. The placentas of cattle have a high concentration of rickettsiae—are they much of a source of infection?

Wherever there are cattle, sheep or goats, the possible presence of Q fever must be considered. Infected animals have no symptoms of disease so that infection must be detected either by antibody surveys or by isolation of rickettsiae. In the United States, California has reported by far the largest number of cases because of the intensive study there by a number of investigators. Idaho probably is second in reported incidence, this being due largely to the long continued interest of Stoenner of the Rocky Mountain Laboratory in Q fever in southern Idaho. After a low level of incidence there for several years, a sudden increase to ninety-three cases occurred in 1958; this year (1959) the incidence is back to a more usual twenty-five cases. The cause for that sudden increase is not clear. Some of the other states in which infection, either in people or cattle, has been reported are Arizona, Iowa, Wisconsin, Ohio, Pennsylvania, Montana, New York and Massachusetts. Luoto, of the Rocky Mountain Laboratory, collected data indicating infection in thirty-five states, but little study has been carried out in the other states. In the Midwest, he states, infection has been reported in cattle in Minnesota and South Dakota, in addition to Iowa and Wisconsin.

The significance of the isolation of rickettsiae from birds and the demonstration of antibodies in their sera is not clear. Human infection has not been traced to birds.

Diagnosis of human disease must be made by laboratory methods since the disease does not differ clinically from diseases such as brucellosis or influenza. The complement fixation test is usually used; a four-fold antibody rise between acute and convalescent sera is considered diagnostic.

The disease has a relatively long incubation period of fourteen to thirty days. There is usually sudden onset with fever and chills or chilly sensation. During the course of illness, headache and poor appetite are common, as well as general aching and profuse sweating. Fever may last from two days to three months but duration beyond three weeks is exceptional. Although respiratory involvement is frequently emphasized, it was not prominent clinically in the California experience. The signs usually consisted of dry unproductive cough and some rales on physical examination. Pulmonary lesions were found in 28 per cent of patients who had roentgenographs of the chest. As in psittacosis, the tetracyclines are of value in treatment.

In conclusion, all domestic and wild animals must be looked upon as potential reservoirs of virus or rickettsial infection which may be transmitted to man.

References

1. Andrewes, C. H.: The aetiology, spread and control of epidemic influenza. Roy. Soc. Health J., 78:533, 1958.
2. Carlstrom, G.: Comparative studies on measles and distemper viruses in suckling mice. Arch. f. Virusforsch., 8:527, 1959.
3. Sovinova, O., Tumova, B., Pouska, F., and Nemec, J.: Isolation of a virus causing respiratory disease in horses. Acta Virolog., 2:52, 1958.
4. Reisinger, R. C., Heddleston, K. L., and Manthei, C. A.: A myxovirus (SF-4) associated with shipping fever of cattle. J. Am. Vet. M. A., 135:147, 1959.
5. Hess, A. D., and Holden, Preston: The natural history of the arthropod-borne encephalitides in the United States. Ann. N. Y. Acad. Sc., 70:294, 1958.

(Additional references are on Page 193)

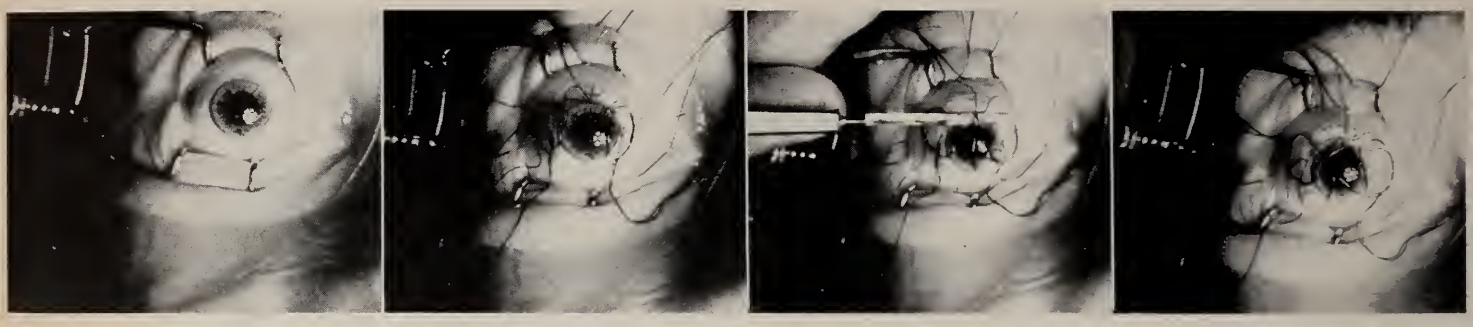


Fig. 1 *(left)*. Speculum inserted. Traction sutures placed in upper lid.

Fig. 2 *(right)*. Preplaced corneoscleral sutures at ten, twelve and two o'clock positions. Conjunctival flap has been prepared above.

Fig. 3 *(left)*. Corneal incision being made with Graefe cataract knife. Incision is then extended with corneal scissors.

Fig. 4 *(right)*. Complete iridectomy has been done in twelve o'clock position.

A Chronology of Cataract Surgery

An interesting history of one of the world's oldest surgical procedures.

THE HISTORY of cataract surgery goes back nearly 3,000 years to the ancient Code of Hammurabi. This was not a medical treatise, but a code of common laws. In this document, it was stated that if the surgery was successful, the surgeon should be paid with pieces of silver. However, if the operation failed, the surgeon was to have his fingers cut off. There was no mention made of the operative procedure as it was then known, since this information was passed by word of mouth only.

The next mention of the cataract operation is found in the writings of a great surgeon of India, Susruta, about 1000 B.C. It was he who first described the couching operation. This is the earliest known recorded description of the technique for the couching procedure. It was not until 320 B.C. when a Greek, Herophilus, became the first to remove an opaque lens from a living eye.

One of the earliest attempts at the definition of a cataract was made by Celsus in 30 A.D. He described a cataract as a suffusion or a slime which obstructed the pupil by "falling down" from above. It was also he who first described in considerable detail the technique of the couching operation. This procedure consists of penetrating the eye lateral to the cornea and just outside the corneoscleral junction with a sharp needle. The needle is then passed through the anterior chamber until the tip rests on the anterior capsule of the cataractous lens. The lens is then tipped backward and nasally, and is gradually dislocated until it falls downward behind the iris and comes to rest in the inferior portion of the vitreous. Partial vision is immediately restored to the eye. This however, may be of only a short duration because of the high incidence of postoperative infection and the frequent occurrence of severe irritative reactions in the eye resulting from the presence of the lens in the vitreous cavity.

Celsus was one of the earliest operators to recommend preoperative preparation prior to the cataract operation. This consisted simply of a

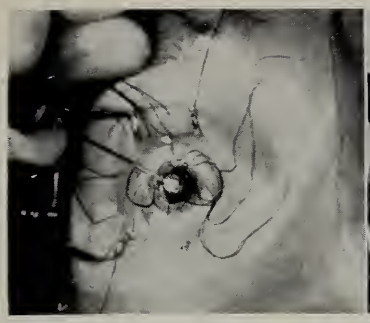


Fig. 5 *(left)*. Erisophake tip in place to grasp anterior lens capsule.

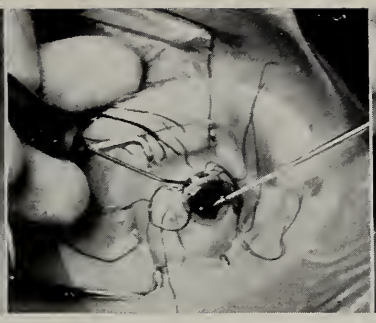


Fig. 6 *(right)*. Lens being dislocated with traction on erisophake and pressure with expressor hook through lower portion of cornea.



Fig. 7 *(left)*. Lens nearly delivered with capsule forceps and expressor hook.



Fig. 8 *(right)*. Completed operation—corneoscleral sutures tied, conjunctival flap anchored over upper portion of cornea.

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Presented as an inaugural thesis before the Minneapolis Academy of Medicine, November 18, 1957.

sparse diet, followed by three days of drinking water only and taking nothing by mouth the day prior to surgery.

The anatomist, Galen, who lived from 130 to 201 A.D., described a cataract as a concretion in the aqueous which could be displaced from in front of the pupil without causing damage to the lens. He considered this as a disease primarily of the brain and central nervous system, causing the opaque material to settle down in front of the lens, thus obscuring the vision.

The Arabian surgeon, Ammar (996 to 1020 A.D.), was the first to remove a cataract by the suction technique. By his method, an incision was made into the eye with a sharp instrument and a small glass tube inserted through the anterior chamber until it came into contact with the lens. An assistant sucked on one end of the tube while the operator maneuvered the other end until the cataract was seen to enter the tip of the tube. The instrument was then withdrawn and with it the cataract was removed. It is mentioned that the operator must be very skillful in this technique lest the entire contents of the eye be sucked out.

The concept of the morbid humor persisted from ancient time through the middle ages until 1705, when Michael Brisseau discovered that a cataract was actually a clouding of the lens itself.

In 1707, Charles St. Yves removed a lens which had been dislocated into the anterior chamber. This was the first recorded incident where a cataract had been removed en masse from an eye.

In 1745, the first deliberate cataract extraction was done by Daviel. From his procedure has evolved our present-day methods of cataract extraction. His technique was as follows: a keratome incision was made inferiorally in the cornea. This incision was enlarged with scissors, encompassing approximately 180 degrees of the corneal circumference. The corneal flap was elevated, and the anterior lens capsule was incised with a sharp needle. The lens material was then removed with a spatula.

Corneal incisions were made in the inferior portion of the cornea until 1784, at which time Pannard first made the incision in the upper portion of the cornea. This permitted better protection of the wound postoperatively and decreased the possibility of iris prolapse.

In the eighteenth century, a London surgeon, Percival Pott, invented the discission method of cataract extraction. This consisted of opening the capsule of the lens, permitting the aqueous to permeate the lens substance. This was followed by absorption of the soft lens material. His operation was the forerunner of our modern extracapsular technique of cataract extraction.

The iridectomy was first done as a preliminary procedure prior to the cataract extraction by Moore in 1864. This was done at intervals of several days to several months before the second stage where the lens was removed. The preliminary iridectomy served two purposes, the first to prevent iris prolapse at the time of the cataract extraction, and the second to determine the tolerance of the patient for ocular surgery in general. A combined cataract extraction, which consists of the iridectomy and removal of the lens as a one-step procedure, was first done by Von Graefe. Prior to 1867, the cornea was allowed to heal without any attempt at close approximation of the corneal incision. However, in that year, Williams was the first to use a corneoscleral suture to close the operative wound.

It was not until the early part of the twentieth century that the intracapsular cataract technique was established as an accepted procedure. In 1910, Colonel Henry Smith, while working in India, described a procedure for the removal of the lens *in toto* which has been known as the "Smith-Indian" operation. This consisted of a preliminary corneoscleral incision over the upper half of the cornea. Pressure was then exerted inferiorly, pushing backward against the vitreous until the inferior portion of the lens had been dislocated from its zonular attachments. By further pressure and manipulation from below, the inferior border of the lens was made to tip forward and was then delivered through the corneal incision by continued pressure through the inferior portion of the cornea with a muscle hook. As might be expected, this technique frequently led to the loss of a considerable amount of vitreous from the eye; however, this operation was widely accepted throughout the world for many years thereafter.

The actual grasping of the lens capsule as an aid in removal of the lens from the eye was first advocated in 1902 by Stoever, who devised a small suction-tipped instrument that we now call the erisophake. By the use of this instrument, the lens could be delivered through a combination of traction on the anterior lens capsule and pressure through the cornea with a blunt instrument. Since less pressure was necessary using this technique, there was consequently less chance of loss of vitreous during the extraction. It was shortly after Stoever's introduction of the erisophake that many forceps were devised to grasp the lens capsule.

In the first half of the twentieth century, there have been many notable contributions to the operation of cataract extraction not only in the development and refinement of the surgical technique, but in the fields of anesthesia, preoperative and postoperative management, and in the prevention of postoperative infection. Prior to 1919, anesthesia was obtained primarily through the use of systemic medication and topical drugs used directly on the anterior surface of the eyeball. Akinesis of the orbicularis muscle was first described in 1919, and in 1920 Van Lint introduced his technique of injection of procaine subcutaneously above and below the eye to block the terminal twigs of the facial nerve supplying the orbicularis muscle. In 1929, O'Brien described his method of blocking the facial nerve as it passes in front of the ear through the parotid gland by the direct injection of procaine into this area. It was not until 1930 that the retrobulbar block was introduced. This injection blocks the ciliary ganglion in the muscle cone and thereby produces complete anesthesia of the eyeball and its contents. These anesthesia procedures have enabled us to operate successfully on cataract patients without the added risks of general anesthesia.

The management of cataract patients preoperatively and postoperatively has improved through the years in much the same fashion as that with other types of surgery. The advent of the various antinauseants and the availability of a number of drugs to allay apprehension has permitted the surgeon to operate in many cases, where it otherwise would have been deemed inadvisable.

The use of the sulfonamide and antibiotic drugs has reduced the incidence of postoperative infection, which, in the case of a cataract operation,

almost invariably leads to loss of the eye or at least the loss of any usable vision.

It is evident that the evolution of cataract surgery, which began over 1000 years before the advent of Christianity, has been a long and tedious process. There has naturally been more progress made in the past fifty years than in all the time before. However, as is the case with many surgical procedures done today, a great many of our modern concepts are based on the work of men of foresight and imagination who lived, in some cases, as many as 3,000 years ago.

Discussion

Dr. W. J. Bushard: I would like to compliment Dr. Cooper on a very interesting paper. It is evident that real progress in successful cataract extraction was made following the advent of good anesthesia, particularly the use of local anesthesia introduced in approximately 1919. Dr. Cooper has reminded us the length of time, some 3000 years, needed to develop a technique quite safe. Indeed, the next important advance was the availability of good suture material to close the eye properly following the removal of the cataractous lens, making this procedure quite safe and highly successful in an otherwise normal eye.

Dr. Richard C. Horns: Probably the most important recent development in cataract surgery is improved wound closure. This improved wound closure is brought about by the use of radial sutures which suture the corneal wound edge to edge. It is possible to suture these corneal wounds edge to edge because of the development of extremely sharp hand honed cutting needles with very fine silk and very fine chromic catgut suture material. The other thing which helps in putting in these sutures is magnification of the operative field by means of a binocular loupe.

The development of the intraocular cataract lens makes it possible for a patient with a unilateral cataract to use both eyes together following cataract surgery. The best known intraocular lenses are the Ridley lens and the Strompelli lens. I feel that these intraocular lenses are still experimental and that eyes have been lost because of them. They cannot be recommended for regular use at this time.

Dr. Karl E. Sandt: In the past twenty-five years, we have seen the evolution from keeping a patient practically in a straight jacket to being up after surgery almost on the same day. I think this has been one of the greatest steps forward, as the patients no longer need fear confinement and postsurgical care.

Many men bandage only one eye, and sand bags, and other restraints are rarely used. The improvement of retrobulbar and lid anesthesia has facilitated the extractions immeasurably, and with the use of scleral-corneal sutures we can feel relatively free to allow the patient many privileges.

Also, we have been able to do surgery on people in their eighties and nineties and not have to feel required to keep them in bed. Their ambulation has apparently caused no difficulty in the healing of the wound and has certainly made it easier for the old folks.

INSECT-BORNE AND ANIMAL-BORNE VIRUS DISEASES OF MAN

(Continued from Page 189)

6. Eklund, C. M., Kohls, G. M., and Brennan, J. M.: Distribution of Colorado tick fever and virus carrying ticks. J.A.M.A., 157:335, 1955.
7. McLean, D. M., and Donohue, W. L.: Powassan virus: Isolation of virus from a fatal case of encephalitis. Canad. M. A. J., 80:708, 1959.
8. Prier, J. E.: Cat scratch fever. Ann. N. Y. Acad. Sc., 70:650, 1958.
9. Becker, F. T.: Milkers' Nodules. J.A.M.A., 115: 2140, 1940.
10. Wheeler, C. E., and Cawley, E. P.: The etiology of milkers' nodules. Arch. Dermat., 75:249, 1957.
11. Pierce, E. C., Pierce, J. D., and Hull, R. N.: B virus: Its current significance. Am. J. Hyg., 68: 242, 1958.
12. Nagler, F. P., and Klotz, M.: A fatal B virus infection in a person subject to recurrent *Herpes labialis*. Canad. M. A. J., 79:743, 1958.
13. Hummeler, K., Davidson, W. L., Henle, W., La-Boccetta, A. C., and Ruch, H. G.: Encephalomyelitis due to infection with herpes virus simiae (Herpes B virus). New England J. Med., 261:64, 1959.
14. Meyer, K. F.: A natural history of plague and psittacosis. Pub. Health Reports, 72:705, 1957.
15. Meyer, K. F., and Eddie, B.: Human pneumonitis viruses and their classification. Arch. Virusforsch., 4:579, 1952.
16. Meyer, K. F., and Eddie, B.: The influence of tetracycline compounds on the development of antibodies in psittacosis. Am. Rev. Tuberc., 74:566, 1956.
17. Gerloff, R. K., and Lackman, D. B.: Observations regarding the presence of psittacosis and related viruses in the northwestern states. Am. J. Pub. Health, 44:323, 1954.
18. Bedson, S. P.: The psittacosis-lymphogranuloma group of viruses. Brit. M. Bull., 9:226, 1953.
19. Barwell, C. F.: Laboratory infections of man with virus of enzootic abortion of ewes. Lancet, 269: 1369, 1955.
20. Stoker, G. P., and Marmion, B. P.: The spread of Q fever from animals to man. Bull. World Health Org., 13:781, 1955.
21. Luoto, Lauri: The epidemiology of Q fever in the United States. Am. J. Pub. Health, 49:334, 1959.
22. Stoenner, H. G., Jellison, W. L., Lackman, D. B., Brock, D., and Casey, M.: Q fever in Idaho. Am. J. Hyg., 69:202, 1959.

Editorials

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Henry G. Moehring, M.D.

WEIGHT REDUCTION AND DIET

Caloric overnutrition may be classified as the predominant American nutritional disease, and dietetic measures are of the greatest importance in the treatment of this disease.

Many diets have been proposed to bring about the correction of obesity. A diet consisting of bananas and skim milk was proposed by Harrop[1] in 1934. This diet included 44 gm. of protein, 4 gm. of fat and 182 gm. of carbohydrate, and it provided 940 calories per day. It was deficient in many of the vitamins and minerals that are considered to be essential.

More recently, Pennington[2] used a diet that was high in protein and fat and low in carbohydrate. The diet called for three parts of lean to one part of fat in meat, and calories theoretically were unrestricted. The program emphasized a definite routine for sleeping, eating and exercise.

Dole and associates,[3] in 1954, suggested treating obesity with a low-protein, "calorically unrestricted" diet, which became known popularly as the "Rockefeller diet." The amount of protein was limited to 35 gm. per day, but the diet provided a surplus of carbohydrate and fat. The authors stressed that the details of routine were important, including scheduling of meals, restriction in choice of food and regulation of activities. They found that the majority of patients soon returned to their previous ways of eating; three to twelve months after dismissal, 52 per cent of them had regained to their original weights.

The so-called "Rockefeller formula diet" also had its origin with Dole's group.[4] This 900-calorie diet contained approximately 21 gm. of protein, and it was extremely inadequate in iron as well as protein. The authors emphasized that the only advantages of this formula diet were its simplicity and inflexibility, and that the diet dealt only with the initial weight-losing phase in the total management of the obese patient.

Man cannot exist in defiance of the law of conservation of energy. Any diet designed to bring about loss of weight must provide fewer calories than the obese person requires to meet the needs of his body for energy. The so-called "calorically unrestricted" diet of Pennington actually may not have been unrestricted in that some of the patients following the diet probably did not eat all of the fat called for in the diet. After several days of eating large quantities of meat, they also may have found a lessened desire for such large amounts of meat and automatically may have reduced their caloric intake. Those patients following the low-protein, calorically unrestricted diet of Dole's group may well have experienced the anorexia of a deficiency in amino acids after using the diet for a time, and accordingly may have reduced their caloric intake.

All diets deficient in calories should be designed so that they are adequate in all aspects but calories. The recommended dietary allowances proposed by the Food and Nutrition Board of the National Research Council should be met for protein, vitamins and minerals. One may be reasonably sure that this has been done when the daily diet includes at least one serving of a leafy, green or yellow vegetable, at least one serving of a food high in ascorbic acid, two average servings of meat, fish, fowl or a substitute, one egg and 1 pint of milk. As a therapeutic measure, the patient may be advised to take a vitamin supplement.

The caloric content of the diet is lowered by decreasing the quantities of foods containing large amounts of carbohydrate and fat. Sugar and sugar-sweetened foods are used sparingly, if at all. Some low-calorie diets contain little fat other than that in meat, fish or fowl and eggs. Limited use of butter or other fats and oils is allowed, and skim milk is used rather than whole milk.

The low-calorie diet should be planned so that the patient will learn proper eating habits. Then, when he has reduced his weight to the desired level, he will know how to select and follow a nutritionally adequate diet that will maintain the ideal weight. The low-calorie diet should give him a basic pattern of eating that can be followed for the rest of his life. For that reason, a low-calorie diet comprising foods commonly available and conforming to the customs of the patient is to be

preferred over one that necessitates odd foods or odd times for eating.

References

1. Harrop, G. A.: A milk and banana diet for the treatment of obesity. J.A.M.A., 102:2003, 1934.
2. Pennington, A. W.: Treatment of obesity: Developments of the past 150 years. Am. J. Digest. Dis., 21:65, 1954.
3. Dole, V. P., Schwartz, I. L., Thaysen, J. H., Thorn, N. A., and Silver, Lawrence: Treatment of obesity with a low protein calorically unrestricted diet. Am. J. Clin. Nutrition, 2:381, 1954.
4. Feinstein, A. R., Dole, V. P., and Schwartz, I. L.: The use of a formula diet for weight reduction of obese outpatients. Ann. Int. Med., 48:330, 1958.

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POLICE TRAINING

Police training is a multi-ordinal term meaning many things to many people. To the officer of a large metropolitan department it may mean six years of college supplemented by pre-service recruit training, annual in-service refresher courses and specialized courses within the department. To the rural constable or suburban patrolman it may mean "riding" with an older officer for two months supplemented by occasional "chats" with the Chief.

The enforcement of laws and the regulation of human behavior is a stimulating and rewarding task. However, it is, at best, highly complex and demanding of the highest levels of judgment and intelligence. To excel the officer must be proficient in many skills. To be inferior or mediocre requires only daily periods of semi-consciousness preceded and followed by the punching of a time clock.

The "thief catchers" and the door shakers have gone the way of the "old lamp lighter." Their modern counterparts in municipal police departments have become buried under a mountain of mechanical gadgets for measuring, and recording everything under the sun—and many things under the skin. Radar speed measuring devices, traffic signals, polygraphs, alcometers and the like are common even in the smaller departments. Thus, the modern police officer is a sometimes engineer, electronics gadgeteer, chemist and quasi-psychologist. The trend in modern police work is away from rather than towards greater specialization, especially in the smaller departments. The suburban officer must be capable of operating all of the various devices within the department. In addition he must be skilled in the more traditional duties of first aid, photography, evidence collection, interviewing and interrogation, marriage counseling, foot and auto patrol, public relations and a host of other subjects.

It is sheer folly to clothe a person in a uniform, provide him with a badge and gun, and then proclaim to the world that he is a policeman. It is no less ridiculous than it would be to provide a man with a stethoscope, white coat and prescription pad and label him as doctor. The garb and tools of the profession must be reserved for those who exhibit a deep interest, understanding and ability for the disciplines of that profession.

Police training traditionally is classified into three major areas or types. First there is pre-service training which includes academic training received at an accredited college or university and may range from two to six years. The two-year program refers to the junior college training courses found primarily in California.

The second type of training and that which is found mostly in the larger cities is recruit training. Recruit training consists of fulltime class and field work given to probationary patrolmen immediately following appointment to a department. Such courses vary in length from a few days to two or three months and are geared to local needs. In a few sections of the country, area or county schools have been established to provide recruit training for a group of men from several small and medium sized departments.

The third type of training and that which is most common among the majority of communities is In-service training obtained either locally or away from the community. Specialized training in traffic law enforcement, delinquency control, laboratory and identification techniques and lie detection comprise the major areas for specialized training. Any training received by an officer after he has been on a department for a period of time would be considered as in-service. The classification of training is made then not on the basis of course material, but rather on the basis of length of service (or even lack of service) of the officer.

The greatest training challenge lies in the task of providing recruit and in-service training for the small and medium sized police departments. A department of less than 200 men is hard pressed

to provide an adequate recruit training program in view of the fact that appointments would be made in small numbers, perhaps never exceeding ten at any one time. Thus, the task of providing a uniform training program for all new recruits is beyond the ability of most departments and virtually impossible for the smaller departments.

Several workable solutions to the problem of training have emerged in the past few years. The first solution and perhaps the oldest is that of county-wide or area-wide schools designed to provide basic knowledge in those areas not strictly controlled by individual departmental policy. These area schools are operational in many sections of the country. The police schools of the Law-Medicine Center in Cleveland are somewhat unique in that they are operated by a private university (Western Reserve University) working in cooperation with a governmental office (Cuyahoga County Coroner's Office) and sponsored financially by the county commissioners. The Suburban Police School is a 170-hour course given during a calendar month. Offered primarily for the fifty-six municipal police departments in suburban Cuyahoga County, 338 students have successfully completed the first twelve sessions. Presently four sessions are offered in each calendar year, two being designated as advanced courses and two being designated as recruit courses. They both contain the same subjects, but the emphasis given to the various subjects changes to better meet the needs of each class according to their experience. In addition to the departments within the county, fourteen agencies from outside the county have sent men through the Suburban Police School.

The curriculum of a basic police training course which is offered on an area-wide basis is by necessity restricted to those subjects not in conflict with local ordinances or departmental policy. This restriction should not work any hardship on the planners of such courses since there is a vast number of subjects remaining to be covered. Major consideration must be given to state criminal statutes, court procedures, evidence rules, first aid, firearms practice, self-defense, public relations, criminal investigative procedures, psychology, interrogation techniques, traffic law enforcement, and a variety of other subjects. Every officer must be fully familiarized with the functions and duties of the other agencies with which he must work in his day to day job. These include the fields of the prosecutor, the courts, the probation officers, the juvenile officers and courts, the prisons and the parole officers. The team concept in the administration of criminal justice bears constant emphasis, for each of us tends to become provincial in our thinking and tends to resent those "outsiders" who also take an interest in the offender.

A second major solution to training for smaller departments has recently developed in New York state. Recent passage of the Municipal Police Training Council Act has provided the basic structure and organization for a state-wide program. The philosophy behind this act is sound and logical and it is surprising that similar legislation has not developed sooner. Police power in this country traditionally has been vested in the states from the time of the writing of the federal Constitution. The delegation of this police power to municipal law enforcement agencies likewise has been traditional. However, in all but a few states, the delegation has been complete with the state retaining control only in those areas where state civil service has dictated employment qualifications. In most other phases, local governing bodies have been given a free hand in the selection, training and direction of their law enforcement officers. In view of the fact that the great body of laws to be enforced are state statutes, central control on the state level does not appear illogical or unreasonable, especially where the communities of less than 10,000 population are concerned.

The New York legislation calls for the creation of a council which will establish training programs throughout the state where needed. When the program becomes established, basic recruit training will be mandatory. No police officer will receive a permanent appointment until he has successfully completed the required training course. This forward step has been a long time coming and should be welcomed as a major break-through in the search for professional police service.

The concept that basic training for law enforcement officers is a luxury which a community can afford only occasionally is totally false. No department is ever so shorthanded that it cannot defer using a man for a month while he is being trained.

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THE HEALTH SIGNIFICANCE OF THE ENVIRONMENT

The relationship between factors of the environment and human health has been suspected for several centuries and well recognized for the past few generations. Even before the causative agents of specific diseases were known, it was found that the application of sanitary measures could have a profound effect on modifying the extent of outbreaks and epidemics. Scientific methods of control have replaced the early "shotgun" measures, with dramatic reductions in many of the diseases that once were common. Water-borne and milk-borne diseases have been reduced almost to insignificance in Minnesota and most of the United States through programs of sanitation in water supply and milk production and processing. Insect-borne diseases have also yielded to programs aimed at environmental control.

Environmental sanitation has been defined by the World Health Organization as "the control of all of those factors in man's environment which exercise or may exercise a deleterious effect on his physical development, health and survival." This is a much broader definition than that which may be in the minds of many people who regard sanitation as something related to water, sewage, and possibly garbage and nuisances. In many underdeveloped areas of the world, water supply and excreta disposal, while important, may be secondary in importance to insect problems.

Minnesota is fortunate in the fact that many of the environmental hazards that exist in much of the world, and even in other parts of the United States, are not present here. Environmental sanitation programs, and even total health programs, in many countries are devoted almost entirely to combatting such diseases as cholera, malaria, yellow fever, bilharziasis, African sleeping sickness, and others that are unknown in this area. (A program for reducing infant mortality, for instance, is of little value if the lives saved at this point are to be sacrificed to disease within a short time.) Minnesota is free of many of the parasitic and insect-borne diseases that occur or have occurred in some of the southern and coastal states. Climate plays a part in limiting the spread of these diseases but general living conditions are also a factor.

It might appear that under the circumstances there is little remaining to be done in the field of sanitation in Minnesota, but this is not the case. Even though a resident or visitor can safely drink water from most of the nearly 600 public water supplies in the state, constant vigilance is required to keep these supplies safe. Many private and semi-public supplies are unsafe and the only reason they have not caused major outbreaks is that the essential causative agent is lacking. Even so there is ample evidence that many cases of intestinal illness are caused by contaminated drinking water. The growth of population and industry challenges the best efforts in control of water pollution and will continue to do so. Many industries have processes that release toxic substances to the environment that need study and control. Air pollution and ionizing radiation are hazards only recently recognized by the public. The control of food service to prevent poisoning and disease requires constant and increased attention. Greatly increased activity in this area is highly essential. Lastly, the water and sewage problems of "suburbia" present the greatest sanitation challenge, not only in Minnesota but throughout the United States.

Several of the sanitation problems in Minnesota will be discussed in more detail in coming months.

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SOCIAL ASPECTS OF AGING

One of the outstanding facts of our time is that the average length of life in the United States has gone up to around seventy-five years for white women and about seventy years for white men (slightly less for colored people). Furthermore, there is a greater likelihood for people to be physically healthy and vigorous in their later years than used to be true. Especially women, who in former years could be considered ready for the rocking chair or the grave when they finished rearing their children, today can usually look forward to twenty years of physical vigor as they reach the age of sixty.

But these biological improvements do not necessarily make for social happiness. In one sense, certain recent social changes have created new problems for elderly people, although these same social changes *could* be regarded as offering new opportunities if elderly people could learn how to take advantage of them.

In the first place, young people are less in-

clined to provide a home for their elderly parents than was true in former years. The greater mobility of young folks, the increase in apartment living with less space for "extra" people, the lesser need for help from the old folks, and the increased desire for independence on the part of the young, all make it less likely that an elderly person can count on living with his children.

Secondly, there is more likely to be enforced leisure in the later years. With various pension plans now in force, and a higher salary standard which makes employers less willing to retain workers when they begin to slow down, compulsory retirement at the age of sixty-five is rapidly becoming almost universal for employees. The situation for women has changed even more drastically. Today the average woman bears her last child at the age of twenty-six years, and when she has reached the early forties, she is "retired" from the main life occupation of child rearing. She still has to maintain a household for her husband and perhaps an adult child or two, but household care without small children is much simplified. So the physically vigorous woman of forty-five years, like the man at sixty-five years, has to seek a new major life role. Society does not automatically provide a new major life role for the "retired" because there is a heritage from the past that "retired" persons were so tired out that they were likely to want only to sit in peace or be restricted to an invalid's bed.

Thirdly, the prestige of age has declined. In past centuries, age was supposed to be associated with wisdom, but today the pace and complexity of events attributes wisdom only to the expert. Also, the elderly person was relatively rare in the past; today the percentage of those over sixty-five years in the population has climbed to almost 1 in 6. The inflation in numbers has seemingly reduced the popularly evaluated worth of the aged person.

These and allied social changes have created a kind of "looseness" in the position of the elderly in our society. They are less likely to have a job, a home (with other people in it), a major life role, honor or recognition than was the case for their counterparts up to a generation ago. Many of the old supports for the elderly have disappeared, and new substitutes are only beginning to develop. During the transition, the elderly are naturally somewhat "lost."

But our society is rapidly developing new institutions and new facilities to restore the elderly to a valued position in the social structure. Social security and retirement systems are providing economic security. Careful thought and guided action are being applied to the housing needs of the elderly. "Golden Age Clubs" and similar organizations are developing to provide for the sociable and recreational needs of the elderly. Some preliminary suggestions of participation of the elderly in politics, if considerably developed, might lead to a higher social status for those who are active. In the case of women especially, whole "careers" are being carved out through work in a great variety of voluntary organizations, in which contributions are made to the community as well as to one's own sense of satisfaction.

These leads are promising, although they have to be greatly expanded and somewhat modified in character to serve the large and growing numbers of the retired. As far as the position of the elderly in American society is concerned, we are truly in the age of transition. But promising developments are taking place, and, best of all, the American people are becoming aware of the problems of aging, so that at least some of the difficulties of the elderly in modern society are on the road to being solved.

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MEDICAL SCHOOL NEEDS

In answer to a recent questionnaire submitted by the American Association of Medical Colleges, the deans of seventy-eight fully developed four-year United States medical schools reported that a total of $1,230,774,000 has been spent since 1948 on the construction of teaching, research and hospital facilities. Of this total, $693,774,000 was spent for facilities on which no federal funds were expended and $537,000,000 on facilities which included $133,500,000 in federal funds in their total construction budgets.

The seventy-eight deans also reported a need for approximately $293,000,000 for new construction and/or renovation of teaching facilities. This does not include their estimates of construction needs for research facilities or hospitals.

If funds were available, sixteen schools indicated that they could start immediate construction on facilities costing $41,500,000; thirty-six schools could begin construction estimated at $184,500,000 by 1960; and by 1961 an additional fourteen

schools could begin construction estimated at $48,000,000. Of the remaining schools, seven indicated no immediate needs, and five could use $19,000,000 between 1962 and 1966 for teaching facilities.

The deans estimated that 850 additional freshman medical students could be accepted by 1965 if funds were made available soon for this construction and renovation program.

Academic Deficits

Budgeted academic vacancies in the United States medical schools have shown an alarming increase in recent years. For instance, budgeted vacancies in 1957-58 were almost twice the number reported for 1956-57: 331 as contrasted with 619.

More startling, however, were the results of a sample questionnaire relative to the number of additional faculty needed, over and above vacant budgeted positions, to teach medicine as it should be taught today. Twenty schools (twelve tax-supported and eight private) reported an average need of fifty additional faculty members—forty-three junior and senior faculty members in traditional departments and six or seven faculty members in the so-called "new disciplines"; that is, physical medicine and rehabilitation, biophysics, biostatistics, psychology, et cetera, as well as eighty additional supporting personnel per school, such as the administrators, clerks, and technicians. Converted to dollars on the basis of prevailing average salaries, approximately $500,000 per school would be needed to hire these people. This is to be compared with a dollar need of $250,000 per school reported in 1953 *(Journal of Medical Education,* February, 1953, by Dr. Ward Darley) to correct academic deficits. Considering the change in demands on schools and problems resulting from increased research, et cetera, this jump to $500,000 per school may be a reasonable estimate.

Tuition Fees Increasing

Since 1939, the average annual tuition fee for medical schools in the United States has increased 114 per cent. Thirty-two per cent of the increase occurred between the years 1950 and 1956. During this same six-year period, the average family income increased 30 per cent, and the cost-of-living index increased by 16.9 per cent.

Early reports from a few medical schools indicated that some schools will raise tuition fees again this year.

MEDICAL SCHOOL APPLICATIONS

The total number of medical school applicants seems to be decreasing in the face of increasing enrolments and increasing graduates from colleges:

Year	*Total Students Enrolled in Colleges*	*Total Number Graduating*	*Total Number Medical-School Applicants*	*Number Medical-School Applicants Represented as Percentage of College Graduates*
1950	2,296,592	433,734	22,279	5.1
1957	3,068,417	340,347	15,791	4.6
1958	3,258,556	365,748	15,172	4.1

The percentage of students entering medical schools with an average grade of A has been decreasing:

College-Grade Average First-Year Medical Students	*1950-1951 (Per Cent)*	*1957-1958 (Per Cent)*
3.6-4.0 (A)	40	18
2.6-3.5 (B)	43	66
1.0-2.5 (C)	17	16

There are also some disturbing trends in the MCAT scores as reported by the research division in the applicant study appearing in the April issue of the *Journal of Medical Education,* ". . . scores of all first-time applicants for each of the years 1952-57, clearly show that a decline in quantitative aptitude and scientific skills as measured by MCAT has occurred, accompanied by a rise in verbal aptitude." However, preliminary studies of the 1958-59 freshman class showed significant increases in both quantitative and science scores, and the average scores for applicants to the 1959-60 class are showing similar trends.

The percentage of students withdrawing during their freshman year in medical schools increased from 5.5 per cent in 1954 to 1955 to 7.8 per cent in 1957 to 1958. Actually, fewer students were available for the second-year class from the 1957 to 1958 class than from the 1956 to 1957 class.

Year	*Total Enrolled in First-Year Class*	*Number Withdrawing*	*Percentage Withdrawing*	*Students Available for Second-Year Class*
1954-55	7,576	418	5.5	7,158
1955-56	7,686	480	6.2	7,206
1956-57	8,014	544	6.8	7,470
1957-58	8,030	629	7.8	7,401

The number of students withdrawing, both in poor and in good standing, increased steadily since 1954:

Year	*Poor Standing*		*Good Standing*	
	Number	*Per Cent*	*Number*	*Per Cent*
1954-55	257	3.4	161	2.1
1955-56	324	4.2	156	2.0
1956-57	368	4.6	176	2.2
1957-58	448	5.6	181	2.3

Association of American Medical College

President's Letter

PROFESSIONAL RELATIONS

Members of the medical profession continue to be critical of themselves as individuals and of one another as to what constitutes good practice and proper conduct. Standards are constantly reappraised and implemented to render a high quality of medical service in the treatment and prevention of disease.

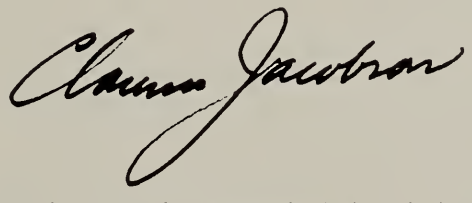
The demand for proper distribution of this service to everyone in need, regardless of ability to pay, has assumed challenging proportions in our present day economic life. Meeting the demands of groups and individuals who are motivated by philosophies alien to tried and time-proven processes, continues to demand united planning and action by organized medicine and their allied agencies.

These times of relative affluence have served to cloud the urgent necessity of the doctor to examine the active forces working to enroll the profession in the service of the state. These alien forces came into being because we have not heeded what the public demanded of us, namely, providing good medical and hospital service within the means of the average income group. The doctors and hospitals came forth with what appeared to be an ideal solution when they instituted Blue Shield as the doctors' plan and Blue Cross as the hospital plan. The early years of these agencies satisfied the needs of the public. As time went on, complexities increased because the rapid advances of medical knowledge demanded expanded facilities for better diagnosis and treatment. The rapid growth of these two agencies together with improved administrative methods kept pace for a time, but soon increases in premiums became necessary. In many areas, Blue Shield was able to meet these demands with modest increases and at the same time offer increased coverage. Blue Cross had problems of increased utilization, higher hospital costs due to increased wages of hospital personnel and expanded diagnostic facilities. Both plans are now in competition with attractive commercial policies offered by large insurance companies who originally had little or no interest in prepayment service plans. This situation in recent years has served to change the original relationship between Blue Cross, Blue Shield and the public it serves. Too often health and welfare issues, when brought to the bargaining table, are a matter of dollars and cents and not necessarily one of service required or provided.

The magnitude of our health problems can be comprehended when we observe what the federal government spends and threatens to spend on welfare in addition to our growing prepayment movement. More than 20 billion dollars is asked for the

coming fiscal year. This item is second only to what is needed for the defense budget. The proposed Forand Bill, with its growing potential, will serve to dilute the other services. This threat has given some of our congressmen pause. In the Eighth District doctors have been asked their opinion of this measure by one of our representatives.

This pause for reflection we hope is sincere, for it affords us opportunity to re-examine our measures to avoid governmental intervention in the practice of medicine. The immediate future may provide our last opportunity. The answer broad enough to meet the objection of oversimplification is obvious. Better professional relations involving organized medicine, Blue Cross and Blue Shield have been responsible for improved co-ordination, resulting in a type of service which maintains confidence of the public in the voluntary system in the majority of states. We must realize that Blue Shield and Blue Cross cannot long exist without the support of the medical profession. Nor can we hope to practice as an independent medical profession without these agencies. Better relationship demands improved communications between our state and county organizations and their components, Blue Cross and Blue Shield and the Hospital Association. We cannot afford prolonged dissension when the fore-mentioned challenges face us. The voluntary system can prevail when these agencies and the medical profession assume their responsibilities with wisdom and maturity. Existing differences between these two great agencies could in all probability have been avoided, to the benefit of all concerned. We will continue to learn much from one another. Differences of opinion can serve to strengthen us, when resolved by understanding and by confining our attention to the issues involved. This we are capable of doing in a statesmanlike manner and by so doing we can work together to merit the growing support of a sound voluntary system of prepaid medical care.



President, Minnesota State Medical Association

Civil Defense News

Carl Waldron, M.D., D.D.S., *Chairman, Civil Defense and Disaster Committee, Minnesota State Medical Association*

M. D. Tyson, *Civil Defense Co-ordinator, Minnesota State Department of Health*

CIVIL DEFENSE SURVIVAL PLAN

To understand better the organizational pattern for the Civil Defense Health, Medical and Special Weapons Defense Service plan, a few items concerning out State government and certain basic assumptions should first be mentioned.

Throughout our Civil Defense planning, attempt was made to utilize, wherever possible, existing state departments to implement the several services organized under the Civil Defense Survival Plan. The Executive Officer of the State Board of Health, by executive order of the Governor, was designated State Chief of the Medical Service. However, in Minnesota, the state mental hospitals and allied institutions are under the supervision of the Division of Medical Services of the State Department of Public Welfare. This Division of Medical Services is headed by a medical director who supervises approximately ten thousand hospital beds outside the target areas. Accordingly, the director of this division was appointed State Chief of the Service's Medical Care Division.

Prior to writing the medical plan, several assumptions were made.

1. The first was that, as a general thing, each hospital in our state—subject to individual variation—had a capability to expand *within its community* to a capacity equal to ten times its normal licensed capacity.

2. The second assumption was that in the event of a Civil Defense Emergency, our problem might be mainly one of well evacuees or might mainly be one of casualty care, or it might be a combination of these two.

3. A third assumption made was that any medical installation could, without difficulty, care for non-casualty evacuees: however, the converse is not true. Thus, it was decided that the Service would have priority over the Welfare Service for the use of a community's facilities.

4. A fourth assumption made was that each hospital would have the capacity of collecting pints of whole blood each dav in an amount equal to its licensed bed capacity for a period of thirty to sixty days and probably much longer.

5. A fifth assumption made was that nursing homes and boarding care homes were not primarily a medical care responsibility but would be handled, except for urgent, necessary medical services, by the Welfare Service.

Within the State of Minnesota and the Northwest Wisconsin Disaster Region II (immediately to the east of our eastern border) there are approximately thirty thousand licensed hospital beds. Of these, ten thousand are within target areas and might not be available in the event of a Civil Defense emergency. As part of our Survival Plan, site-to-site relocation of these target city hospitals is planned, should time permit. Were this not possible, we would be left with twenty thousand beds outside the target areas, which, if expanded ten to one, would provide some two hundred thousand beds in the reception areas. Professional personnel to staff these institutions would have to come from target areas and could reasonably be expected to get out proportional to the number of casualties.

The Civil Defense Health, Medical and Special Weapons Defense Service plan provides that during a Civil Defense emergency:

1. It is the resopsibility of the Service to provide all emergency medical care and treatment of the general population and Civil Defense personnel, to provide emergency public health services to meet disaster conditions, and to provide preventive and remedial measures to minimize the effects of plant and animal biological warfare and chemical warfare.

2. All medical supplies, equipment and special medical vehicles are under the control of the Service.

3. Manpower needed in addition to that preassigned to the Service may be requisitioned from the Civil Defense Manpower Service.

4. All medical facilities in the county and municipality are under the control of the Service, and the Service has priority for the use of other public, semi-public and private structures in the state.

5. If there is time, target area hospitals' professional staff, auxiliary personnel, material and patients will be relocated out-state.

6. Emergency treatment stations will be established on the periphery of the target areas on the evacuation routes.

7. Non-target area hospitals will expand their facilities by ten times their licensed bed capacity.

8. Medical care and treatment will be provided for target area casualties, the local population and Civil Defense personnel at either an

(Continued on Page 206)

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

TWO-BED HOSPITAL ROOM CHARGES VARY WIDELY THROUGHOUT THE UNITED STATES

Minneapolis ranks in eighth place among major cities over 100,000 population in the United States with respect to the average charge for a two-bed semi-private hospital room.

The average charge for a two-bed semi-private hospital room in cities of more than 100,000 population ranges from a low of $9.29 a day to a high of $27.80 a day, according to a report of the Health Insurance Institute. When the nationwide survey was extended to cities with populations of 25,000 or more, the variance was wider, with a low of $8.00 a day and a high of $32.00 a day.

The study was based on information supplied by the American Hospital Association from a survey of hospitals throughout the United States conducted early in 1959. The survey measured weighted average hospital room rates for cities of 25,000 or more population.

The survey disclosed that generally rates and charges were higher in the West, Northeast, and North-Central sections of the country and lower in the South.

There also is a considerable spread in the average hospital rate within larger cities, due to the existence of both large and small hospitals, of which some offer comprehensive services and others make available simpler services.

The difference in hospital rates and charges is reflected in most health insurance programs, whether it is a group plan or an individual policy.

"Provision of medical care in the United States historically has been local in character and the charges established by the providers of medical and hospital services therefore reflect not only the cost of living in the local community, but the range of services provided and the types of patients served," stated the Institute.

Rates By City

The average rate for a two-bed semi-private hospital room, which varies both between cities and within cities, is listed below for some of the nation's larger cities, in descending order of cost:

Oakland, $27.80; Los Angeles, $25.40; San Francisco, $25.22; Cleveland, $24.34; Boston, $24.04; Seattle, $23.50; New York City, $20.93; Minneapolis, $20.63; Detroit, $20.00; Washington, D. C., $19.80; Chicago, $19.77; Phoenix, $18.86; Milwaukee, $18.24; Indianapolis, $18.11; Baltimore, $16.94.

Omaha, $16.85; Pittsburgh, $16.85; Philadelphia, $16.48; St. Louis, $15.88; Denver, $15.66; Kansas City, Missouri, $15.29; Salt Lake City, $14.71; Dallas, $14.44; Louisville, $14.30; New Orleans, $14.28; Miami, $14.24; Memphis, $13.68; Atlanta, $13.06; Tulsa, $12.09; and Montgomery, $9.29.

Nearly 22 million persons, one out of every eight in the United States, were admitted to the nation's short-term general hospitals in 1958, according to statistics of the American Hospital Association.

NEED FOR MORE PHYSICIANS FOR A GROWING POPULATION CITED

"The need to produce 3,600 additional physicians a year by 1975 in order to keep pace with a growing population is a problem of such magnitude that it demands the immediate attention of all medical schools and all other groups concerned with medical education," the President of the Association of American Medical Colleges asserted at the opening session of the Seventieth Annual Meeting.

Doctor John McK. Mitchell, Dean of the University of Pennsylvania School of Medicine, referred to the findings and recommendations made by the Consultant Group on Medical Education of the United States Public Health Service, of which he is a member. Their report, "Physicians for a Growing America" has just been released.

In his talk, "The Medical Schools are the Keystone of Medical Progress," Doctor Mitchell warned that we are already falling short of maintaining the ratio of physicians to population that has existed in the United States since 1940, a level considered by the report to be a minimum satisfactory goal. Doctor Mitchell pointed out that the two stumbling blocks to obtaining an ample supply of well qualified students lay in the length and cost of medical education. Noting that ample scholarships are available nationwide to Ph.D. candidates in fields related to medicine, such as physics, chemistry, and biology, he revealed that there are no federal, local or private programs of scholarship aid for medical students comparable to those

for other graduate students. He believes, therefore, that it is up to the medical schools to raise funds for scholarship and loan funds from both private and governmental sources.

this responsibility and will continue to use all resources at their command to further reasonable solutions. He pointed out that the medical schools also can contribute to this effort by "helping con-

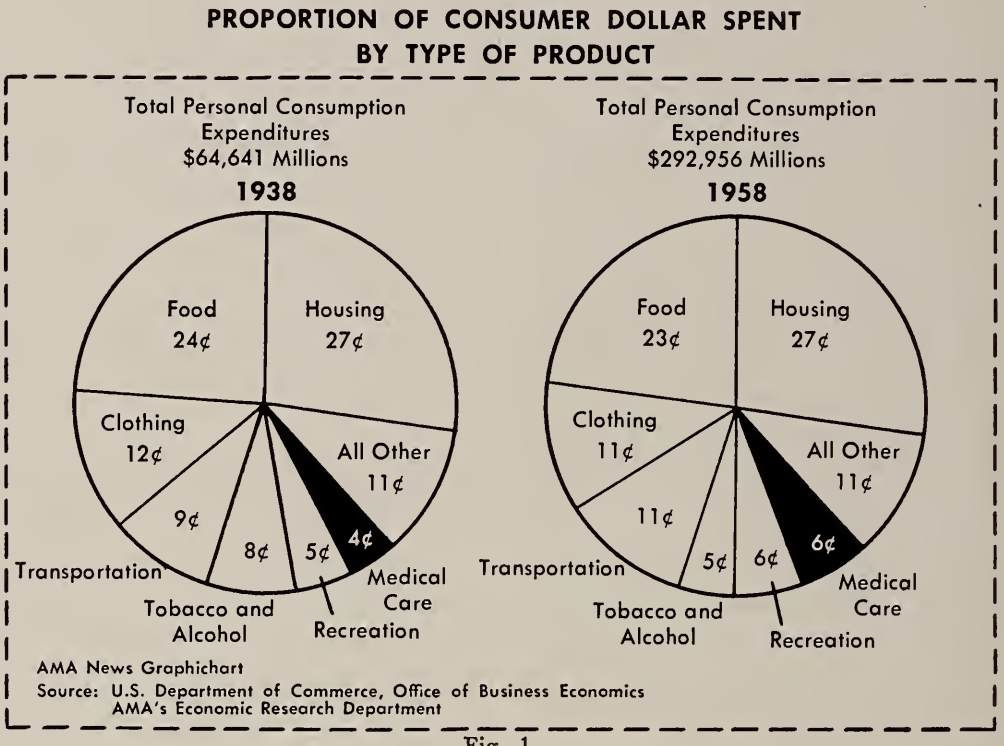


Fig. 1.

Doctor Mitchell said the report offered three solutions for meeting the medical manpower requirements: increased enrollment in existing schools, inauguration of new programs of basic medical science, and the establishment of new four-year medical schools. He emphasized that a major contribution must come from new four-year schools. However, he continued, if $325 million were available for new construction and renovation of teaching facilities, existing schools could increase their annual admissions by about 1,060 students. He urged that steps be taken to provide the necessary funds.

In a report to the medical educators, Dr. Leroy E. Burney, Surgeon General of the United States Public Health Service, said, "The problem of medical education will not be solved unless they are recognized and dealt with as matters of public policy by responsible leaders at all levels of government and in all sectors of national life."

Doctor Burney told his audience that the Public Health Service and the Department of Health, Education, and Welfare have taken their share of vince the American public that the need exists for a multi-million dollar expansion of existing schools and the establishment of twenty to twenty-four new two-year and four-year schools." The Surgeon General also based his statements on the new report of the Consultant Group on Medical Education.

The principal recommendation of the consultants, the Surgeon General said, was directed toward bringing about an increase in the number of physicians graduated annually from schools of medicine and osteopathy from the present 7,400 to some 11,000 by 1975.

DOCTORS GET SMALLER SHARE OF MEDICAL CARE DOLLAR

American physicians and dentists are getting a smaller share of the medical care dollar today than they did twenty years ago.

This fact has been revealed by the Economic Research Department of the American Medical Association, based on United States Department of Commerce data.

In 1938, physicians received 31 cents of the medical care dollar, but the physician's share in 1958 was 24 cents—or 22.6 per cent less than twenty years ago.

In addition to the amount which physicians and dentists received as their share of the medical cost dollar, 22 cents went for drugs in 1938, but the figure dropped 9.1 per cent in 1958 to 20 cents.

PROPORTION OF DOLLAR SPENT FOR MEDICAL CARE BY TYPE OF CARE

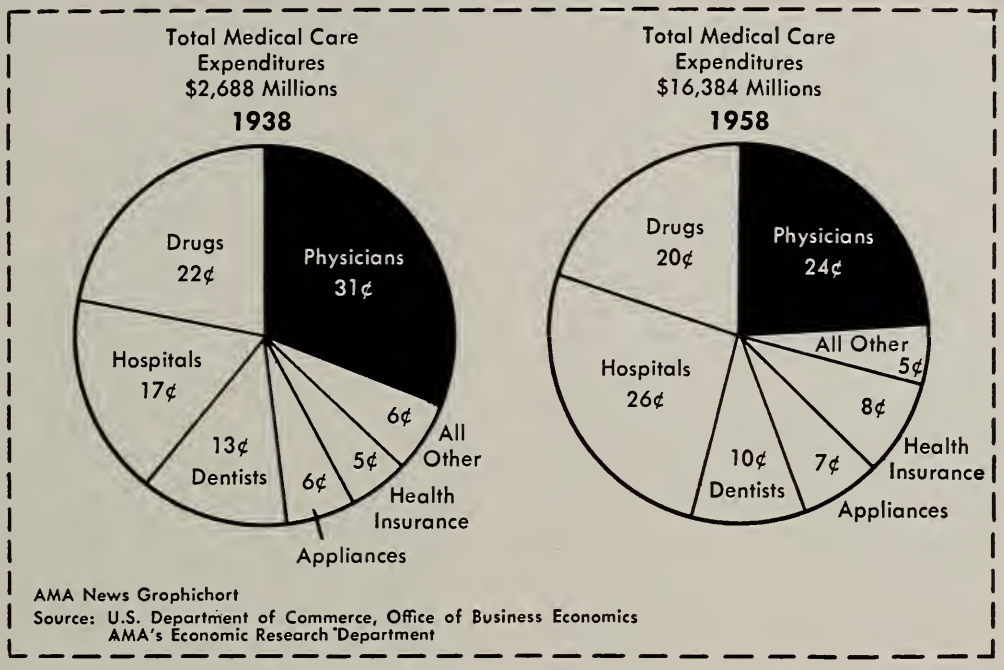


Fig. 2.

Dentists received 13 cents of the medical care dollar in 1938, but their share dropped 23.1 per cent to ten cents in 1958.

The breakdown of figures was based on a total of $16.4 billion spent for medical care in 1958—an average of $95 per person.

This represents 5.6 per cent of the $293 billion spent by Americans during the year for all goods and services.

The percentage of 1958 expenditures for medical care compares with 5.8 per cent for recreation and 5.3 per cent paid out for tobacco and alcoholic beverages.

Of total consumer expenditures for medical care in 1958, hospitals claimed $4.3 billion, physicians $3.9 billion, drugs $3.3 billion, dentists $1.7 billion, health insurance $1.4 billion, and ophthalmic products and orthopedic supplies $1.1 billion.

The remaining $769 million went for all "other medical costs," including osteopathic services, private duty nurses, chiropractors, chiropodists, and other miscellaneous curative and healing services.

Purchases of appliances took another 7 cents of the 1958 dollar, while items in the "all other" categories claimed the remaining 5 cents.

Items showing a proportionate increase include hospitals, which received 17 cents of the dollar in 1938 and 26 cents in 1958—a jump of 52.9 per cent. Hospitals attribute this rise to the expansion of hospital services and their greater utilization which has increased the number and variety of skilled personnel required.

More than 71 per cent of the United States population today is protected by some form of health insurance, compared with less than 10 per cent in 1938.

This means that in a large measure illness is not being paid for by income received in any particular day, week, month or year.

And while more Americans are budgeting more of their income for medical care, and more emphasis is being placed on planning against future illness, the physician is receiving a smaller portion of the total money spent for medical care.

PHYSICIAN COSTS SHOW INCREASE OVER FEES

Physician's fees have risen only 84 per cent during the past twenty years, while the cost of clerk's salaries has risen 203 per cent during the same two decades. Nurse's salaries have risen 177 per cent. Many other costs of medical practice have risen sharply in contrast to the rise in most physician's fees.

Since 1939, automobile insurance has risen 166 per cent; automobile repair, 94 per cent; gasoline, 80 per cent; motor oil, 57 per cent; and the cost of a new car, 130 per cent.

For the same period, the cost of office furniture rose 125 per cent; professional equipment, 93 per cent; rent, 60 per cent; telephone service, 56 per cent, and gas and electrical service, 11 per cent.

Costs of supplies and services have also risen substantially. Today, bath towels are 170 per cent above 1939 prices; bed sheets, 133 per cent higher; toilet tissue, 93 per cent; laundry soap, 87 per cent; toilet soap, 73 per cent; cleaning and pressing, 73 per cent; surgical dressings, 37 per cent and stationery, 135 per cent.

CIVIL DEFENSE

(Continued from Page 202)

ETS or an expanded hospital facility. Priority for all medical care is:

(a) Maintenance of health and production capability of non-casualty survivors.
(b) First aid and medical-surgical attention minimal (walking wounded) casualties to return them to productivity as soon as possible.
(c) Medical care to women of child-bearing age and children.
(d) Casualties that reach the medical channels.

9. Whole blood will be collected by each hospital each day in an amount of pints equal to its licensed bed capacity.

10. Public health nursing services will be provided.

11. Emergency environmental health measures will be established.

12. Plant and animal biological warfare and chemical warfare defense measures will be established.

13. Mobile personnel and equipment support will be provided as needed and within prevailing capabilities.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

NIGHT CLUB MUSICIAN POSING AS PHYSICIAN SENTENCED FOR ILLEGAL POSSESSION OF NARCOTICS

On January 22, 1960, Robert A. Crea, thirty-one, 1490 Sargent Ave., St. Paul, was sentenced by the Hon. Leslie L. Anderson, Judge of the District Court of Hennepin County, to a term of not less than five years and not more than twenty years in the State Prison at Stillwater on a charge of illegally possessing narcotic drugs. Judge Anderson then suspended the sentence and placed the defendant on probation for the same period of time. Crea had previously entered a plea of guilty to the charge on December 15, 1959 before District Judge D. E. LaBelle who then referred the matter to the Hennepin County Probation Office for a pre-sentence investigation.

The defendant was arrested on December 7, 1959 after a number of complaints had been received from Minneapolis druggists that a man posing as a doctor had been telephoning their stores stating that he had issued a prescription for 40 tablets of dilaudid for a patient at a certain address, and that the prescription would be furnished at the time the drugs were delivered to the home of the patient. On December 7, 1959, Alan Lee Palmquist, sixteen, a delivery boy for the Lakeview Pharmacy, 3342 Hennepin Avenue, identified a photograph of a man who, earlier that day, had handed him a crude non-printed prescription made out in longhand for 40 tablets of dilaudid, at the time that delivery of the tablets had been made. The prescription bore the purported signature of a doctor of medicine. The photograph which Palmquist identified was that of the defendant.

Crea, who has no medical training and is a musician in a Hennepin Avenue night club, admitted that he had obtained dilaudid in a similar matter from more than ten Minneapolis pharmacies. At the time Crea was arrested a vial containing fifteen tablets of dilaudid was found in his shirt pocket, which made it possible for the charge of illegal possession of narcotics to be filed against him. Although the defendant has no prior conviction for a felony, he was convicted of a misdemeanor in Minneapolis Municipal Court on August 23, 1957. On that date Judge Dana Nicholson sentenced Crea to a ninety-day term in the Minneapolis Workhouse on a charge of possessing an implement for the use of a narcotic drug. However, Judge Nicholson suspended the sentence on condition that the defendant be of good behavior.

ARE FEWER MEDICAL STUDENTS WORKING?

It appears that fewer medical students were employed during the academic year 1957-58 than in the two immediately preceding years. The dean's office of thirty-nine United States medical schools recently reported that 27.4 per cent of the students were employed during 1957-58. This compares with 35 per cent who were employed in 1956-57, as reported in "Ecology of the Medical Student." Approximately 49 per cent of the students were earning part of their medical school costs in the school year 1955-56, according to a sample survey of forty-four schools conducted by the National Opinion Research Center.

Public Health

MEDICAL LABORATORY SURVEY IN MINNESOTA

Current considerations in medical laboratory work in Minnesota are for the development of a program in evaluation of chemistry procedures and technical consultation. This has grown out of the results of a survey of medical laboratories conducted in the state in 1957 and 1958. The survey results are reported in a paper entitled "Design for Development of Medical Laboratories: Personnel and Practices," by Ruth I. Heinemann, M.T. (ASCP), Henry Bauer, Ph.D., and Helen L. Knudsen, M.D., which appeared in *The Journal of Medical Technology* (Vol. 25, No. 3, 1959).* The survey was one of the activities of the Hospital Services Demonstration Program† of the Minnesota Department of Health. Earlier work supported by the W. K. Kellogg Foundation indicated the need for obtaining this base line of information from which needs could be determined for developing effective measures in providing better patient care in the state. Interest in medical laboratories in Minnesota shown by the Minnesota State Medical Association, Minnesota Hospital Association, Minnesota Society of Clinical Pathologists, Minnesota Society of Medical Technologists and others led to the development of the project supported by the W. K. Kellogg Foundation and that of the Hospital Services Demonstration Program.

The survey in 1957-58 was conducted through personal interview of medical laboratory personnel in all instances, and pathologists and hospital administrators when interest was indicated. The questionnaire form used in the interviews consisted of 182 questions of which 149 were coded and tabulated by International Business Machine equipment. A total of 181 of the 183 licensed hospitals were visited by two medical technologists (ASCP). In the tabulation of the results, thirty-six of the hospitals were excluded because they either did not have laboratory personnel or equipment, or they did not have the personnel to use the equipment that was in the laboratories. In addition, University Hospitals, Mayo Clinic, St. Mary's Hospital (Rochester) and Veterans Administration Hospital were excluded.

The results of the survey are reported under main topics on the basis of over-all summary analysis, personnel training level analysis and bed capacity group analysis. The bed capacities of the hospitals range from 6 beds to 565 beds. They are divided into five groups. Those in the first three groups (0 through 20 beds, 21 through 30 beds, 31 through 70 beds) are found in cities of population of 6,000 and less and are designated as rural hospitals. Those in the other two groups (71 through 130 beds, 131 beds and greater) are found to be in cities of population of more than 6,000 and are designated as urban hospitals. The personnel are divided into five groups of which three are designated generally as medical technologists (M.T.(ASCP)** with degrees, M.T. (ASCP) without degrees, and technical personnel who have had at least two years of college work but are not certified "M.T. (ASCP)"). The other two groups are designated generally as laboratory assistants (technical personnel who have had one year or less of training in which the academic and practical have been combined, and those who have had training on the job).

The major findings of the survey are summarized below on the basis of these analyses.

1. Three-fourths of the 145 laboratories surveyed are in rural hospitals.

2. Urban hospital laboratories employ two-thirds of all of the 614 technical personnel.

3. Approximately half of the personnel are medical technologists.

The main portion of this article is abstracted from the published report, "Design for Development of Medical Laboratories: Personnel and Practices," by Ruth I. Heinemann, M.T. (ASCP), Henry Bauer, Ph.D., Helen L. Knudsen, M.D., appearing in *The American Journal of Medical Technology*, 25:3, 145-165, 1959.

*Reprints are available upon request from the authors at the Minnesota Department of Health, University Campus, Minneapolis 14, Minnesota.

†The Hospital Services Demonstration Program was supported by research grant W-49 from the United States Public Health Service, National Institutes of Health, Division of Research Grants.

**M.T. (ASCP): Medical Technologist certified by the Registry of Medical Technologists of the American Society of Clinical Pathologists.

4. In urban laboratories most of the personnel are medical technologists. The medical supervision is given by pathologists. Technical supervision is given by medical technologists.

5. In rural hospital laboratories a large proportion of the personnel is laboratory assistants. There is almost no medical supervision. Technical supervision is given by laboratory assistants.

6. The mean and median salaries for technical personnel in urban hospitals are higher than those for technical personnel in rural hospitals. (The mean salaries in the urban groups are $297 and $346 respectively. Those in rural groups are $281, $272, and $287 respectively). The mean salaries for medical technologists are higher than those for laboratory assistants. (The mean salaries for medical technologist groups are $377, $356, and $331 respectively. Those for laboratory assistant groups are $262 and $278 respectively.)

7. Only medical technologists (ASCP) with baccalaureate degrees show a consistent increase of salary with increased experience. (A mean of $350 at less than one year of experience increasing to a mean of $406 at more than ten years of experience.)

8. Medical technologists have a greater mean experience (7½ years) than do laboratory assistants (5 years and 1 month).

9. Technical personnel, particularly those in rural laboratories, attend professional meetings to a limited extent.

10. The stated need for additional personnel is for twice as many medical technologists as laboratory assistants. Three times as many medical technologists are stated to be needed in urban laboratories as in rural.

11. Non-technical personnel assist with clerical and/or maintenance duties primarily in urban hospital laboratories.

12. There is a greater variety of technical procedures and equipment in urban hospital laboratories than in rural.

13. Two-thirds of the colorimetric instruments are pre-calibrated. Most of them are in rural laboratories. One-fourth of the colorimetric instruments have been calibrated each time a procedure is done.

14. Two thirds of the laboratories purchase all of their reagents ready for use. Almost all of the rural laboratories and a small number of the urban laboratories do this.

15. Quality control measures are used to a greater extent in urban hospital laboratories than in rural hospital laboratories. Solutions of standard concentration for instrument calibration and commercially prepared artificial serum are used in more hospital laboratories than are solutions of standard concentration for recovery measurement and pooled serum.

16. Almost all of the hospital laboratories expressed an interest in state-wide evaluation studies in all phases of medical technology and particularly in hematology, chemistry and blood banking.

The review of the survey findings resulted in proposing five programs for developing medical laboratory services in hospitals in Minnesota. Each was proposed with full realization that successful planning and implementation are dependent upon joint participation of the medical technologists, pathologists, other practicing physicians, hospital administrators and members of the staff of the Minnesota Department of Health. The programs are as follows:

1. The establishment of a laboratory which will serve as a central point from which evaluation studies may be conducted in several fields of medical technology.

2. The promulgation of consultation services in laboratory techniques and related matters in medical technology, particularly in rural areas.

3. The establishment of refresher training and specialized training courses to provide group instruction in areas of need indicated by evaluation studies and consultation.

4. The continuation of personnel recruitment programs with emphasis on supplying more medical technologists to rural areas dependent upon recognition of this need through increased salaries and variety of work.

5. The development of a uniform system of tabulating work load in hospital laboratories to facilitate interlaboratory comparison of work done.

The current considerations growing out of the survey for the development of an evaluation and technical consultation program for laboratories in Minnesota encompass the first two proposals. The need for this evaluation and technical consultation is emphasized by the findings that almost all of the laboratories are interested in evaluations, and that there is a small number of colorimetric instruments which are regularly calibrated as well as limited use of quality control measures in the hospital laboratories. This program has been duly considered and approved in principle by the Minnesota Commission on Patient Care, the Minnesota Society of Medical Technologists and the Minnesota Society of Clinical Pathologists.

Ruth I. Heinemann, M.T. (ASCP)

Medical Legal Opinion

● *The purpose of this section entitled Medical Legal Opinion is to publish news of recent litigation concerning medical practice as well as to cite past actions and opinions of the Court in medical legal matters as a means of refreshing our knowledge of such procedures.*

American Hospital Association

STATEMENT OF HOSPITAL—PHYSICIAN SPECIALIST RELATIONSHIPS

In Anesthesiology, Pathology, Physical Medicine, and Radiology

At one time, principles for arrangements between hospitals and physician specialists were agreed upon in joint statements between the American Hospital Association and certain medical specialty societies. The medical specialty societies have in all cases withdrawn their support for these statements so that none is currently in effect.

The American Hospital Association, therefore, wishes here to identify the issues and state its position on them, offering to hospitals practical suggestions where possible for the establishment of sound relations between hospitals and physician specialists.

1. First and foremost, the American Hospital Association has stated and continues to support the statement that it is the right and responsibility of both hospitals and physicians to develop on the basis of local conditions and needs, any terms of service which are fair to patients and which are designed to provide high quality care.

This freedom for hospitals and physicians in the interest of patients is of fundamental importance and transcends proprietary ethical concepts and disputed legal doctrines.

The American Hospital Association takes the position that good patient care is being and will continue to be provided in hospitals, both voluntary and governmental, under many forms of agreement.

2. The physician specialist is expected to exercise freely and completely his medical judgment and skill, and to strive constantly to promote an improvement of the quality of medical care.

The specialist's practice should be, from a standpoint of medical judgment, as independent as that of other staff members. Similarly, it is subject to review by the medical staff organization.

The freedom of the physician specialist to exercise his medical judgment and skill can be maintained under a variety of relationships which are agreeable to those concerned at the local level.

3. The American Hospital Association recognizes that certain diagnostic and therapeutic services are a vital part of the professional services rendered in a hospital.

A hospital must provide the attending physician what he needs for diagnosis and treatment in the care of his patient. As such, it must provide space, facilities, and trained personnel not only in operating rooms, delivery rooms, medical and surgical wards, but in laboratory, x-ray and other diagnostic areas as well.

The professional services provided in a hospital shall be determined by its governing body, medical staff and administration.

4. *Hospitals have the responsibility for charges to patients for hospital services.*

Whenever an in-hospital monopoly situation is created, someone besides the purveyor of the service must approve the charges to patients since total costs for hospital facilities and services are of concern to the governing body and the public.

Since it is the responsibility of hospitals to determine which hospital services will be provided it also becomes the responsibility of the hospital, through its governing body, to determine the charges for these hospital services.

5. The physician specialist is entitled to fair remuneration for his services considering his training and experience and the level of compensation prevailing in the locality for physicians of comparable qualifications.

The following guides for hospitals in hospital-physician relationships have been developed and have been approved by the Board of Trustees of the American Hospital Association:

1. Responsibilities of Hospital and Physician Specialist.
2. Seeking and Appointing a Physician Specialist.
3. The Hospital Approach to a Physician Specialist Arrangement.
4. Formal Agreements Between Hospitals and Physician Specialists.
5. Legal Considerations in Hospital-Physician Specialist Relationships.
6. Medical Ethics and Hospital-Physician Specialist Relationships.

6. The American Hospital Association recognizes that as diagnostic and treatment services become more complex it is necessary more and more for hospitals to consult with the medical staff on matters relating to hospital-physician specialist relationships. This is particularly true: (a) regarding the specialist's selection where professional qualifications determine the individual to be selected, (b) regarding unresloved problems arising in connection with hospital and physician specialist relationships, including financial problems, and (c) regarding charges made for services.

(Approved by Board of Trustees, November 20, 1959.)

American Medical Association

The House of Delegates of the American Medical Association at the Dallas meeting received twelve resolutions on the subject of relationships between physicians and hospitals. To resolve any doubt about its position, the House did not act upon any of the resolutions but instead reaffirmed the 1951 "Guides for Conduct of Physicians in Relationships with Institutions." It also declared that "all subsequent or inconsistent actions are considered superseded."

RELATION OF PHYSICIANS AND HOSPITALS

December, 1951

So far as it can be determined on the basis of study made by the Bureau of Legal Medicine and Legislation of the American Medical Association, as a matter of law the corporate practice of medicine is illegal in most states. In almost all instances the classic example given by the courts of the type of corporate practice of a profession that is illegal is the instance in which a corporation hires a professional man and then sells his services to the public on a fee basis for the profit of the corporation. Such exceptions as there are refer to statutory legislation in several states permitting certain modifications of this general law. It must also be remembered that fee splitting with a corporation is just as unethical as fee splitting with another physician.

In addition to being guided by the laws of the various states, physicians in their relationships with hospitals must be guided by the Principles of Medical Ethics of the American Medical Association. Those sections of the Principles which have a distinct bearing on these relationships are as follows:

Chapter I, Sec. 3.—"Groups and Clinics.—The ethical principles actuating and governing a group or clinic are exactly the same as those applicable to the individual. As a group or clinic is composed of individual physicians, each of whom, whether employer, employee or partner, is subject to the principles of ethics herein elaborated, the uniting into a business or professional organization does not relieve them either individually or as a group from the obligation they assume when entering the profession."

Chapter III. Article VI. Sec. 2.—"Conditions of Medical Practice.—A physician should not dispose of his service under conditions that make it impossible to render adequate service to his patients, except under circumstances in which the patients concerned might be deprived of immediately necessary care.

Chapter III. Article VI. Sec. 3.—"Contract practices.—Contract practice as applied to medicine means the practice of medicine under an agreement between a physician or a group of physicians, as principles or agents, and a corporation, organization, political subdivision or individual, whereby partial or full medical services are provided for a group or class of individuals on the basis of a fee schedule, or for a salary or for a fixed rate per capita.

"Contract practice per se is not unethical. Contract practice is unethical if it permits of features or conditions that are declared unethical in these Principles of Medical Ethics or if the contract or any of its provisions causes deterioration of the quality of the medical services rendered."

Chapter III. Article VI. Sec. 6.—"Purveyal of Medical Service.—A physician should not dispose of his professional attainments or services to any hospital, lay body, organization, group or individual, by whatever name called, or however organized, under terms or conditions which permit exploitation of the services of the physician for the financial profit of the agency concerned. Such a procedure is beneath the dignity of professional practice and is harmful alike to the profession of medicine and the welfare of the people."

In conclusion, the Principles of Medical Ethics states: "These principles of medical ethics have been and are set down primarily for the good of the public and should be observed in such a manner as shall merit and receive the endorsement of the community . . ."

The duties of the Judicial Council are specified in the Constitution and Bylaws and among those duties the following is prescribed:

"The Council shall have jurisdiction on all questions of medical ethics and the interpretation of the laws of the Association.

"The Council at its discretion may investigate general professional conditions and all matters pertaining to the relations of physicians to one another and to the public, and may make such recommendations to the House of Delegates or the constituent associations as it deems necessary.

"The Council shall have authority to request the President to appoint investigating juries to which it may refer complaints or evidence of unethical conduct which in its judgment are of greater than local concern. Such investigating juries, if probable cause for action be shown, shall submit formal charges to the President, who shall appoint a prosecutor to prosecute such charges against the accused before the Judicial Council in the

name and on behalf of the American Medical Association. The Council may acquit, admonish, suspend or expel the accused."

The primary obligation of both physicians and hospitals is to serve the best interest of the patients. The decision as to the ethical or unethical nature of practice must be based on the ultimate effect for good or ill on the public as a whole. All of the various questions involved in the relationship between physicians and hospitals, both legal and ethical, particularly questions dependent on local conditions, must be considered in the first instance at the local level because of the various differences which of necessity exist in the many sections of the country.

One of the factors that has aggravated physician-hospital relationship is the inclusion of medical services in the contracts of voluntary hospital service plans. The medical profession is fostering voluntary health insurance, and we believe that nothing should be done to disturb this very important and essential program. However, the American Medical Association has reaffirmed many times through its then Bureau of Medical Economics, its Judicial Council and the House of Delegates the principle that hospital service plans should exclude all medical services, and the contract provisions of such plans should be limited exclusively to hospital services. At the same time, so that there would be no misunderstanding as to which services should or should not be included, the House of Delegates has stated that ". . . if hospital service is limited to include only hospital room accommodations, such as bed, board, operating room, medicine, surgical dressings and general nursing care, the distinction between hospital service and medical service will be clear." (Proceedings of the San Francisco Session of the House of Delegates, 1938, p. 31). Past actions of the House of Delegates give every reason to reiterate that radiology, anesthesiology, pathology and physiatry constitute the practice of medicine.

In order to initiate a method for remedying this situation, it is recommended that Blue Shield and Blue Cross be requested to cooperate to the extent of writing all new contracts in such a manner that Blue Shield will cover insurable medical services and Blue Cross will cover insurable hospital services. It is hoped that the professional and hospital authorities and the voluntary prepayment plans will cooperate in furthering these recommendations.

Since the physician and hospital are interdependent, it is incumbent on both to be interested in all phases of their scientific and financial relationships. This means that the professional staff of the hospital has very definite responsibilities toward not only other members of the professional staff, whether active or courtesy, but also toward hospital management. The recommendations of the staff concerning medical matters are usually accepted by the management of the hospital through its board of managers or trustees. It must also be remembered that to be approved for residencies in specialties by the American Medical Association and the American College of Surgeons, certain requirements are mandatory to the institution, among them adequate pathologic and radiologic coverage. As a rule, the staff of a hospital elects an executive committee or works under an appointed executive committee to advise the lay officers of the institution on purely professional matters, and recommends who may or may not use the institution for professional work. Unfortunately, in many instances, the financial problems of the lay hospital management have been no affair of the staff or of its professional executive committee. This is wrong and probably the cause of most of the differences of opinion between physicians and hospital management. The financial problems of an institution in which a physician does his professional work are definitely of importance to him and to the professional staff, and the proper consideration must be given to these problems if the hospital is to work efficiently and remain the workshop of the physician, and without proper facilities the services rendered to the public are in jeopardy and these public services are the all-important function of both hospital and staff.

*Neither the hospital management nor the medical staff has the privilege or the right to make compulsory assessments of members of the medical staff for building funds or to demand an audit of staff members' personal financial records as a requisite for staff appointment.

Every professional man on the appointed staff should have a voice in the professional management of the institution. The pathologist, roentgenologist, anesthesiologist and physiatrist, as well as the other professional staff members, should have equal standing as active members of the staff with all the rights and privileges pertaining to other members of the staff of equal standing. The chiefs of these departments should be nominated and appointed in the same manner as are the chiefs of other major departments in the same hospital.

The revised Principles of Medical Ethics has been written with all of these various factors in mind and is broad enough to cover all possible ethical physician-hospital relationships. The Constitution and Bylaws of the American Medical Association distinctly covers methods of procedure for all persons who have a complaint so that they may approach the Judicial Council. The functions of that Council are specifically delineated.

"In the event of a controversy between physician and physician, or physician and hospital management, on these problems, it is recommended that, since local conditions must be taken into consideration, these problems be resolved insofar as possible at the local level.

*1958 amendment, in accordance with Resolution No. 55, House of Delegates, American Medical Association, June Session 1958.

"There can be no exploitation of the doctor or of the hospital if everyone concerned in management and on the professional staff will work together to supply the greatest possible good quality medical and hospital services to the public. In any given controversy, every effort should first be made to settle the matter at the staff-management level. In case of failure to settle the controversy at this level, assistance of the county medical society should be requested. If, then, it cannot be resolved it should be submitted to a committee of the state medical association for advice and recommendation. If problems cannot be solved at the staff-management level, through the county medical society, or through the state medical association, the Constitution and Bylaws of the American Medical Association provides that ". . . the (Judicial) Council, at its discretion, may investigate general professional conditions and all matters pertaining to the relations of physicians to one another and to the public, and may make such recommendations to the House of Delegates or the constituent associations as it deems necessary."

To implement the settlement of such controversies, it is recommended that each component medical society and each constituent state and territorial medical association appoint a Committee on Hospital and Professional Relations. This committee should be available to receive complaints from any physician, hospital, medical organization, or any other interested person or group with reference to professional or economic relations existing between doctors of medicine and hospitals. On receipt of such complaint by such a committee the matter should be investigated and acted on in such manner as will best effect adjustment of the complaint.

Another approach that should not be neglected in activating this report is that of the local and state hospital associations. Most of the states and many communities have hospital associations providing direct representation for the hospitals within their areas. It seems reasonable to assume that state medical associations and component county medical societies could well effect liaison with these organizations in the settlement of problems involving physician relationships.

In summary, the following general principles are suggested to individual physicians, county medical societies, and state medical associations as a basis for adjusting controversies, these principles, however, to be qualified to the extent required by the applicability of one or more of the factors heretofore mentioned:

1. A physician should not dispose of his professional attainments or services to any hospital, corporation or lay body by whatever name called or however organized under terms or conditions which permit the sale of the services of that physician by such agency for a fee.
2. Where a hospital is not selling the services of a physician, the financial arrangement if any between the hospital and the physician properly may be placed on any mutually satisfactory basis. This refers to the remuneration of a physician for teaching or research or charitable services or the like. Corporations or other lay bodies properly may provide such services and employ or otherwise engage doctors for those purposes.
3. The practice of anesthesiology, pathology, physical medicine and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine.

Minnesota State Medical Association

RESOLUTION

Whereas, a wise and foresighted legislature of the State of Minnesota has written laws in Minnesota prohibiting the practice of medicine by corporations and individuals not licensed physicians, and

Whereas, the American Medical Association has repeatedly studied the problem and has stated in 1943 that the "House of Delegates of the American Medical Association is opposed to the division of any branch of medical practice into so-called technical and profession factions," and later in 1951, that "the practice of anesthesiology, pathology, physical medicine and radiology are an integral part of the practice of medicine in the same category as the practice of surgery, internal medicine or any other designated field of medicine," and in 1955 reaffirmed its position on these matters.

Therefore Be It Resolved that the Minnesota State Medical Association first, officially recognizes the specialty of Anatomical and Clinical Pathology as the practice of medicine; second, reaffirms the philosophy that in-hospital and outpatient diagnostic laboratory services are in fact the practice of medicine and thirdly, in future contracts or actions relating to laboratory medicine actively reaffirms the belief in the legal control of all medical laboratory facilities in the State of Minnesota by licensed doctors of medicine.

Passed by: (1) Commitee on Hospital and Physician Relationships, (2) Committee on Resolutions, and (3) House of Delegates Minnesota State Medical Society, May 23, 1958.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

THE SIXTIES DECADE OF DECISION

There is a revolution going on in your own backyard—a revolution that within ten years could alter your whole life, determine how you practice medicine, and dictate the way you care for your patients, reports the PR DOCTOR.

The crisis will come in the '60's, perhaps within a matter of months. The decision to be made is this: Who will take the leadership in solving medical and health problems?

This is no case of the "good guys" versus the "bad guys." It is a case of Americans looking for the best way to provide medical care for everyone. The goals on each "side" are the same, but the mechanisms for achieving them are different.

The whole revolution stems from a growing feeling that suitable medical care is not only important, it is a right to which everyone, regardless of his financial status, is entitled.

Yet people are increasingly willing to let the government assume the responsibility for health affairs. For though they bear no grudge against medical organizations, a lot of Americans feel physicians are losing this leadership by default.

In a recent survey conducted for AMA by an independent firm, the result showed that doctors, individually and collectively, are guilty of a communications failure.

The survey points up communications failures in these vital areas:

1. Failure to communicate to patients understandingly and understandably about their illnesses.
2. Failure to communicate effectively regarding fees and medical costs as they relate to other prices today.
3. Failure to communicate effectively on a personal level with patients. This leads to complaints that the doctors are cold, indifferent to people's personal problems both medical and financial; that they don't care about people's feelings, that they make people wait too long.
4. Failure to communicate the story on the long-established programs medicine has launched, that is, to train more doctors, to get these doctors into communities needing them, to police their own ranks.
5. Failure to communicate its real public interest on the case of the indigent, the aged, the economically stricken.

Part of the communications failure may be traced to doctors' commendable reticence to promote themselves and their organized projects. Many a doctor will say, "If you do a good job, people will ultimately find out about it." But "ultimately" may be too late. Politicians are wasting no time promoting unsound and undesirable schemes to "governmentalize" medicine. They know that salesmanship of a product—or a point of view—is essential today.

Today the medical profession must adapt its techniques to the times. Doctors' medical societies and allied groups must emphasize through every available means to the public that working to improve today's medical system will provide better medical care in the long run than substituting a government system.

The technique is positive action coupled with better communications.

SIX FOR THE SIXTIES MAKE SERVICE YOUR SLOGAN

1. *Service from a Personal Physician.*—Though physicians rate higher than dentists or lawyers on ethics and dedication, physicians are more often criticized in areas of personal service. Analysis of the opinion survey shows that the physician's own attitudes and motives along with the efficiency with which he runs his office are keys to service attitudes. Consequently, every physician should be aware not only of his own personal public relations, but for the public relations of the entire profession.

Needed are increased professional educational efforts on human relations techniques, ways to communicate to people more effectively, more orientation courses for new members, more refresher courses for regular members, more medical society action to establish courses in medical schools on non-scientific medical subjects.

2. *More Medical Service.*—Over one-fifth of the Americans surveyed feel there is a doctor shortage and some intimate the profession actually limits supply. About one-fourth indicate a local need for more hospital facilities. Problems appear greater in rural areas.

Needed are all-out publicity on medicine's recently stated positive policy regarding recruiting more young people into medical careers, offering medical scholarships, expanding medical schools, and ultimately training more doctors, joint efforts by medical societies and medical schools working together to tell what's being done to increase the number of medical graduates, local studies on ways to expand facilities, set up scholarships, as recommended at AMA's Dallas clinical meeting, and an awareness that the public interest is not served when medical societies and medical schools can't get along together.

3. *Better Medical Service.*—Lack of prompt service properly administered coupled with the criticism that you can't always get a doctor when you need one, are at the root of much of the criticism of the medical profession, the survey says.

Needed are more educational programs to stress the importance of securing a family doctor before emergencies arise, repeated study of grievance committees to make sure they are functioning effectively and that people know they exist, continued emphasis on office efficiency to reduce service complaints related to unnecessary waits, difficulty of access to a doctor, lack of adequate time for patients.

4. *Service at Reasonable Price.*—The weakness of medical efforts to communicate the true story on medical costs and resultant lack of understanding of financial motives leads to public feelings that doctors are excessively money-minded, charge more than expected, and do not try to keep charges as low as possible.

Needed are greater widespread educational efforts on medical care costs in relation to other costs today, promotion of medicine's traditional guarantee to provide medical care to all, regardless of ability to pay, whether these plans are formal or informal, development of relative value studies as recommended by AMA's House of Delegates among societies in this aspect of cost, continued education of individual physicians on the importance of itemizing medical bills, initiating advance fee discussions, cutting costs where possible for patients, increased emphasis on using not abusing health insurance plans and promotion of wider insurance coverage.

5. *Service Beyond the Call of Duty.*—Today doctors are less often credited than are dentists or lawyers with trying to help solve community problems. Medical societies should tackle at least one positive community service project in 1960.

6. *Service as Citizens.*—1960 is an election year. Consequently, doctors as private citizens should actively encourage people to vote, work in the political parties of their choice, and generally work for good government. It is as important for medicine to support sound legislation as it is to oppose unsound bills.

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ALDACTONE introduces a new class of therapeutic agent, the aldosterone-blocking agent providing:

satisfactory relief of resistant or advanced edema even when all other agents, alone or in combination, are ineffective or are only partially effective.

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ALDACTONE acts by blocking the effect of aldosterone, the principal mineralocorticoid governing the reabsorption of sodium and water in the distal segment of the renal tubules.

By so doing Aldactone establishes a fundamentally new and effective approach to the control of edema or ascites, including edema resistant or unresponsive to conventional diuretic agents.

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It is fully expected that Aldactone will change present medical concepts of the therapeutic limitations of managing edema. Many patients living in a greater or lesser state of edematous invalidism can now be edema-free. To others, gravely ill, Aldactone will be life-saving.

When used alone, Aldactone will produce a satisfactory diuresis in about half of those patients whose edema is resistant to conventional diuretic agents.

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DOSAGE: For most adult patients the optimal dosage of Aldactone, brand of spironolactone, is 100 mg. four times daily. Aldactone should be administered for at least four or five days before appraising the initial response, since the onset of therapeutic effect is gradual when it is used alone. Aldactone manifests accelerated activity with greater response as early as the first and second days when used in combination with a mercurial or thiazide diuretic.

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Communications

BLOOD CHOLESTEROL AND FOODS

Addition of unsaturated fats and oils to the otherwise unchanged ordinary diet will not reduce blood cholesterol and prevent heart attacks and strokes, the Food and Drug Administration said today. Representations to the public that salad oils, shortenings, oleomargarine, and similar products have value for these purposes are false and misleading and will cause such products to be misbranded, FDA declared in a statement of law-enforcement policy published in today's Federal Register.

George P. Larrick, commissioner of Food and Drugs, said there is widespread interest in the possible relationship between blood cholesterol levels and heart and artery diseases. As a result, he explained, reference to the term "cholesterol" in the labeling of common foods now being offered to the public may have the effect of a claim of special value for preventing or treating these diseases.

Commissioner Larrick added: "Scientific investigations of fatty substances as a possible factor in lowering blood cholesterol and preventing heart disease should be continued, and this policy statement does not interfere in any way with legitimate research and clinical evaluation of unsaturated fats in the diet. It is our responsibility, however, to point out that the public has been misled into relying prematurely on data which are still experimental, incomplete, and contradictory, and to head off false and misleading promotions based on such data."

Cholesterol, FDA explained, is a substance that is manufactured in the body and has an important function in many of the body tissues. It is also present in animal fats and oils such as butter, lard, bacon, and meat fat. The blood level of cholesterol is controlled largely by synthesis in the body and is affected very little by the amount present in our foods.

FDA further pointed out the view of nutrition scientists that it is impracticable for a person to add enough unsaturated fats to an otherwise unchanged diet to bring about any significant change in blood cholesterol. Increased weight they add, is the only result that is likely to be achieved by increasing the intake of fats.

The FDA policy statement, based on an extensive survey of leading medical authorities, follows:

§3.41 Status of articles offered to the general public for the control or reduction of blood cholesterol levels and for the prevention and treatment of heart and artery disease under the Federal Food, Drug, and Cosmetic Act.

(a) There is much public interest and speculation about the effect of various fatty foods on blood cholesterol and the relationship between blood cholesterol levels and diseases of the heart and arteries. The general public has come to associate the term "cholesterol" with these diseases. A number of common food fats and oils and some other forms of fatty substances are being offered to the general public as being of value in the control or reduction of blood cholesterol levels and for the prevention or treatment of diseases of the heart or arteries.

(a) The role of cholesterol in heart and artery diseases has not been established. A causal relationship between blood cholesterol levels and these diseases has not been proved. The advisability of making extensive changes in the nature of the dietary fat intake of the people of this country has not been demonstrated.

(c) It is therefore the opinion of the Food and Drug Administration that any claim, direct or implied, in the labeling of fats and oils or other fatty substances offered to the general public that they will prevent, mitigate, or cure diseases of the heart or arteries is false or misleading, and constitutes misbranding within the meaning of the Federal Food, Drug, and Cosmetic Act.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

REPLY TO FOOD AND DRUG ADMINISTRATION STATEMENT

The Food and Drug Administration has stated that some recent advertising for unsaturated fats, including vegetable oils, was "false and misleading."

Our position has been that research results are definitely in favor of the beneficial effects of unsaturated fats in the diet and that the public should be made aware of this evidence.

The research findings of many leading medical and nutritional authorities are on public record emphasizing the importance of vegetable oils not as "additions" but as replacements for other fats in the diet. Our own evaluations and our sponsorship of resarch in this field began more than a decade ago, but we refrained from public statements until we believed the results were well substantiated.

(Continued on Page A-66)

*Public Health Service Publication No. 537, Health Information Series No. 89. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

as it calms anxiety!

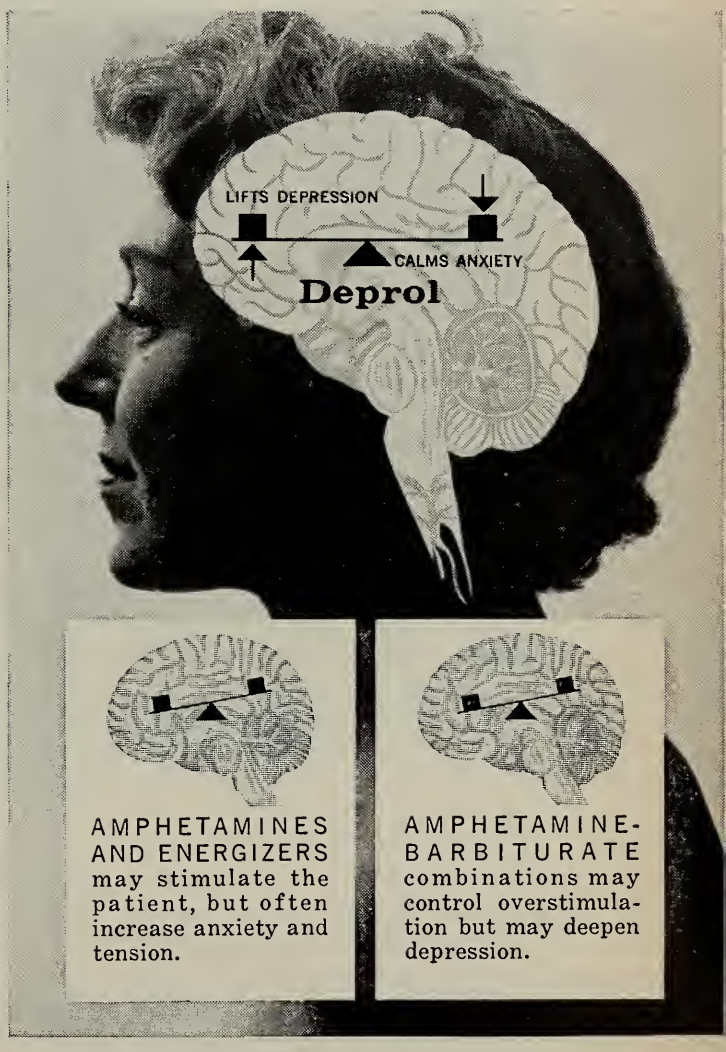
Smooth, balanced action lifts depression as it calms anxiety... swiftly and safely

Balances the mood — no "seesaw" effect of amphetamine-barbiturates and energizers. While amphetamines and energizers may stimulate the patient — *they often aggravate anxiety and tension.* And although amphetamine-barbiturate combinations may counteract excessive stimulation — *they often deepen depression.*

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Acts safely — no danger of liver damage. Deprol does not produce liver damage, hypotension, psychotic reactions or changes in sexual function — frequently reported with other drugs.



BIBLIOGRAPHY *(10 clinical studies, 714 patients)*:

1. Alexander, L. (35 patients): Chemotherapy of depression — Use of meprobamate combined with benoctyzine (2-diethylaminoethyl benzilote) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Boteman, J. C. and Carlton, H. M. (50 patients): Meprobomate and benoctyzine hydrochloride (Deprol) as adjunctive therapy for patients with advanced concer. Antibiotic Med. & Clin. Therapy 6:648, Nov. 1959. **3.** Bell, J. L., Tauber, H., Sonty, A. and Pulito, F. (77 patients): Treatment of depressive states in office proctice. Dis. Nerv. System 20:263, June 1959. **4.** Breitner, C. (31 patients): On mental depressions. Dis. Nerv. System 20:142, (Section Two), May 1959. **5.** McClure, C. W., Popas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresio, G. B. (128 patients): Treatment of depression—New technics and therapy. Am. Pract. & Digest Treat. 10:1525, Sept. 1959. **6.** Pennington, V. M. (135 patients): Meprobamate-benactyzine (Deprol) in the treatment of chronic broin syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **7.** Rickels, K. and Ewing, J. H. (35 patients): Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **8.** Ruchwarger, A. (87 patients): Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **9.** Settel, E. (52 patients): Treotment of depression in the elderly with o meprobamate-benactyzine hydrochloride combination. Antibiotic Med. & Clin. Therapy. In press, 1959. **10.** Splitter, S. R. (84 patients): The core of the onxious ond the depressed. Submitted for publicotion, 1959.

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REPLY TO FOOD AND DRUG ADMINISTRATION STATEMENT

(Continued from Page A-62)

The Department of Health, Education and Welfare, through the Public Health Service, in 1957 began public distribution of a bulletin, currently in circulation, titled "The Food You Eat and Heart Disease."* Among the quotations from this pamphlet are some very positive statements relating to cholesterol levels, and unsaturated fats. . . .

"Most medical scientists now agree that there is a relation between the amount of cholesterol in the blood and the depositing of fat in the blood vessels. . . ."

"Some fats in the diet actually lower blood cholesterol, while other fats raise the level in the blood. It is not yet entirely clear why this is so. Current experiments indicate that the degree of 'saturation' of the fats may be a factor. . . ."

At about the same time this pamphlet was issued, on the basis of the evidence, we first introduced the subject in our advertising.

With the increasing evidence of the beneficial role of unsaturated fats in the diet, there is strong public demand for other products which will reduce blood cholesterol. The National Research Council has called for such developments, saying that "shortening and margarine producers should re-evaluate the merits of blended fats and anticipate the problems that will be raised by increased demand for such fats." Accordingly, we have created a new and superior margarine, high in polyunsaturates, containing pure liquid corn oil. This product, Cornette margarine, is now in major test markets and we plan to make it widely available in the near future.

Certainly, nothing the FDA has said detracts from the wholesome, nutritious, and flavorful qualities of either Mazola corn oil or Cornette margarine. We are, of course, co-operating with the Food and Drug Administration. But because of tremendous public interest in the ultimate truth, Corn Products Company will continue to sponsor research in the field of nutrition. We will use every opportunity to bring the results to the attention of the government, medical authorities, and the general public.

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This flaky pie crust, *crisp cookies, Chiffon cakes, biscuits can all be made easily with Wesson. Decrease the calories of pie by preparing with single crust and a fresh fruit or gelatin filling. It is delicious.*

FREE *Wesson recipes are available in quantity for your patients, showing them how to prepare these treats as well as main dishes, vegetables and salads with poly-unsaturated vegetable oil. Request quantity needed from The Wesson People, Dept. N., 210 Baronne St., New Orleans 12, La.*



Wesson satisfies the most exacting appetites. To be effective, a diet must be *eaten* by the patient. The majority of housewives prefer Wesson particularly by the criteria of odor, flavor (blandness) and lightness .of color. (Substantiated by sales leadership for 59 years and reconfirmed by recent tests against the next leading brand with brand identification removed, among a national probability sample.)

Wesson's Important Constituents

Wesson is 100% cottonseed oil . . . winterized and of selected quality

Linoleic acid glycerides (poly-unsaturated)	50-55%
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Total unsaturated	75-80%
Palmitic and stearic glycerides (saturated)	20-25%
Phytosterol (predominantly beta sitosterol)	0.4-0.7%
Total tocopherols	0.09-0.12%

Never hydrogenated—completely salt free

Each pint of Wesson contains 437-524 Int. Units of Vitamin E.

Woman's Auxiliary

BLUE EARTH VALLEY MEDICAL AUXILIARY OFFERS NURSING SCHOLARSHIP

Again this year, the Woman's Auxiliary to the Blue Earth Valley Medical Society is offering a nursing scholarship. To the senior high school girl from Faribault county $100 will be given on the day she receives her cap from an accredited Minnesota hospital or school of nursing. The only reservations are that the girl must have spent the senior year in the high school from which she is graduating, and if she has already won a local nursing scholarship, such as those offered by local hospital auxiliaries, she may not qualify.

The scholarship award is the project of a comparatively small group of women, the wives of medical doctors in Faribault, Martin and Watonwan counties. At present, the auxiliary has twenty-seven members.

The $100 gift will be offered to applicants from Faribault county.

Application forms went to the school principals in every high school in Faribault county. Application may be secured by writing to the Scholarship Committee, Mrs. Mark Virnig, Wells, Minnesota.

Completed applications had to be sent in by March 15.

RAMSEY COUNTY AUXILIARY NEWS

The February Board Meeting was called to order by Mrs. William Menold, vice president. Mrs. Coleman Connolly informed the members that the dinner-dance given by the Auxiliary at the Town and Country Club was a financial success and Mrs. Rodney F. Sturley thanked the members of her committee for their help. The party was a very pleasant, informal one, and one that we hope will be a yearly event.

Mrs. Davitt Felder explained the importance of the Smathers-Keogh-Simpson Bill. During the meeting members wrote letters in favor of the Bill to Senator Eugene J. McCarthy. Mrs. Felder also asked members to acquaint themselves with the Forand Bill so that when the time comes they will be familiar with it and will be able to write to their congressman.

Dr. Brian J. McGroarty will give a talk on Blue Shield at the March meeting which will be held in the Minnesota Club.

State president-elect, Betty Gardner, will take a leave of absence from her Auxiliary duties, to attend the National Curling meet in Chicago. Betty is a member of the Bonnie Spielers team which will take part in the competition.

ZUMBRO VALLEY MEDICAL AUXILIARY HEARS TWO TALKS ON ISRAEL, HOLLAND

The Zumbro Valley Medical Auxiliary held its quarterly meeting recently at the Mayo Foundation House.

Guest speakers on the program entitled "Know My Country," were Dr. Henry Neufeld and Dr. C. A. Wagenvoort. Both are on special appointments in the Mayo Foundation.

Dr. Neufeld, a senior cardiologist from Tel-Hashomer Government Hospital in Israel, talked on "Inside Israel." He traced the historical development of Israel, told of its growth during the past ten years and showed slides of Tel-Aviv, Haifa and Jerusalem.

Dr. Wagenvoort, chief pathologist at the State University in Leyden, Holland, talked on "Inside Holland." He said Holland is a sea-faring nation and has at Rotterdam the greatest harbor in the world with the exception of New York City. His listeners were surprised when he said Holland is the most densely populated country in the world. He said its people have made the best use of their land for agriculture and a few years ago started the Delta Plan to safeguard the coast line.

Preceding the program, coffee was served to the fifty members and guests present.

SCOTT-CARVER MEDICAL AUXILIARY NEWS

The Scott-Carver Medical Auxiliary is happy to announce that it now has 100 per cent membership. The Scott-Carver Auxiliary President is Mrs. E. M. Doherty, New Prague, Minnesota.

HENNEPIN COUNTY "CAROUSEL" SET

The annual "Carousel" style show and brunch sponsored by the Woman's Auxiliary to the Hennepin County Medical Society and produced by the Dayton Oval Room, will be held April 27 and 28 at 9:30 a.m. in the Dayton Sky Room.

This is the only fund-raising project undertaken by the Hennepin County Auxiliary and by this its many philanthropies are supported.

Tickets are $3.25 each and may be secured by writing to Mrs. Henry Quist, Jr., 4116 Glencrest Road, Minneapolis 16, Minnesota. There will be favors for all, some very special door prizes and, of course, up-to-the-minute styles to be enjoyed. Members are urged to make reservations now.

AUXILIARY WILL DISTRIBUTE HEALTH CAREERS PACKETS

Health Career Packets, prepared by the Minnesota State Medical Association, allied career groups, and the Minnesota State Department of Health, will be distributed by members of the Woman's Auxiliary to all state private and public high schools, according to announcement by Mrs. Roy C. Pedersen, State Paramedical Careers Chairman.

The packets are attractive folders which contain recruiting material for all the allied medical careers including medicine. Private groups were solicited to pay for the cost of the packets.

All Auxiliary presidents and paramedical chairmen have been asked by Mrs. Pedersen to co-operate in the project. They will distribute one packet to the high school principal or guidance counselor and another one to the school library. The library copy will be used exclusively by the students. About 1,000 packets should be distributed throughout the state by Auxiliary members.

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In Memoriam

WINCHELL McK. CRAIG

Dr. Winchell McK. Craig, neurologic surgeon, former head of the Section of Neurologic Surgery at the Mayo Clinic and professor of neurologic surgery in the Mayo Foundation, Graduate School, University of Minnesota, died February 12, 1960. He was sixty-seven years old.

Doctor Craig born in Washington Court House, Ohio, was a student at the Culver Military Academy. In 1915, he received the degree of Bachelor of Arts from the Ohio Wesleyan University. In 1919, he was awarded the degree of Doctor of Medicine by the Johns Hopkins University.

Doctor Craig came to Rochester on July 1, 1921, as a fellow in surgery of the Mayo Foundation.

He was appointed a first assistant in neurology in 1924, and on April 1, 1926, he became a member of the staff as a neurologic surgeon. He was head of the Section of Neurologic Surgery in the Mayo Clinic from 1946 to April 1, 1955, when he became a senior consultant, and he retired from active practice on July 1, 1957, after thirty-one years as a member of the staff. In the same year, Doctor Craig was named director of civil defense of the city of Rochester. In June, 1959, Dr. Craig was appointed a field representative of the Council on Medical Education and Hospitals of the American Medical Association. He resigned this post in November of the same year to accept the appointment of special assistant for health and medical affairs to the Secretary of Health, Education and Welfare, U. S. Government.

Doctor Craig was appointed an instructor in neurologic surgery in the Mayo Foundation, Graduate School, University of Minnesota, in 1927, and was advanced to the grades of assistant professor in 1929, associate professor in 1932 and professor in 1937.

In 1945, Doctor Craig became the first physician from civilian life in the history of the U. S. Navy to reach the grade of rear admiral.

An Associate member of the Minnesota State Medical Association and the Zumbro Valley Medical Society, Doctor Craig was a fellow in the American Medical Association and the American College of Surgeons, and a member of the American Surgical Association, the American Neurological Association, the Western Surgical Association, the Southern Surgical Association, the Minnesota Society of Neurology and Psychiatry, the International Surgical Society, the Central Neuropsychiatric Association, the Central Society for Clinical Research, the Johns Hopkins Alumni Association, the Alumni Association of the Mayo Foundation, the Minnesota Surgical Society, the International Neurological Association, the American Legion, the Reserve Officers' Association of the United States, the Ohio Society of New York, the Beta Theta Phi academic fraternity and the Phi Beta Pi professional medical fraternity. He was an honorary member of the American Academy of Neurological Surgery. He was a member of the editorial staff of *The Journal of Neurosurgery* and the special advisory board to *Postgraduate Medicine*. In 1956, he was elected president of the Mayo Foundation chapter of the Society of the Sigma Xi. He served as chairman of the American Board of Neurological Surgery, Inc., and as a member of the Board of Trustees of the Ohio Wesleyan University.

Survivors include his wife, Jean Katherine, four children, Lieutenant Winchell McKendree Craig, of the U. S. Marine Corps, San Diego, California, James Stewart Craig, a student at the University of Minnesota, Jeanne Mary Patricia Craig, a student nurse completing her work at the University of Oregon, and Graham Fitzgerald Craig, also a student at the University of Minnesota; and two brothers, Thomas H. and Robert A., who reside in Washington Court House, Ohio.

ESKIL ERICKSON

Dr. Eskil Erickson, Halstad physician and surgeon, died February 19, 1960, at the age of fifty-nine years.

He was born in Wheaton and was a graduate of the University of Minnesota Medical School, serving his internship at Ancker Hospital in St. Paul. He had practiced in Halstad since 1931.

The deceased was a member of the Red River Valley Medical Society, the Minnesota State Medical Association and the American Medical Association.

Doctor Erickson is survived by his wife, Frances; a daughter, Karen Marie, a student at North Dakota University; two sisters, Elva and Thelma Erickson, both of St. Paul; and two brothers, Lennart, Litchfield and Holding, Wheaton.

FRANK GARRETT FOLKEN

Dr. Frank Garrett Folken, Albert Lea, Eye, Ear, Nose and Throat specialist, died January 31, 1960. He was sixty-seven years old at the time of his death.

Born in Schuyler, Nebraska, Doctor Folken was a graduate of the University of Nebraska Medical School. He served as a Lieutenant in the Navy at Great Lakes during World War I.

He came to Albert Lea in 1919. Doctor Folken was in general practice there for five years and then took specialized study at the University of Vienna in Eye, Ear, Nose and Throat, and upon his return to Albert Lea specialized in Eye, Ear, Nose and Throat until he retired in 1959.

He was a member of Christ Episcopal Church and had served as a vestryman and senior warden of the church.

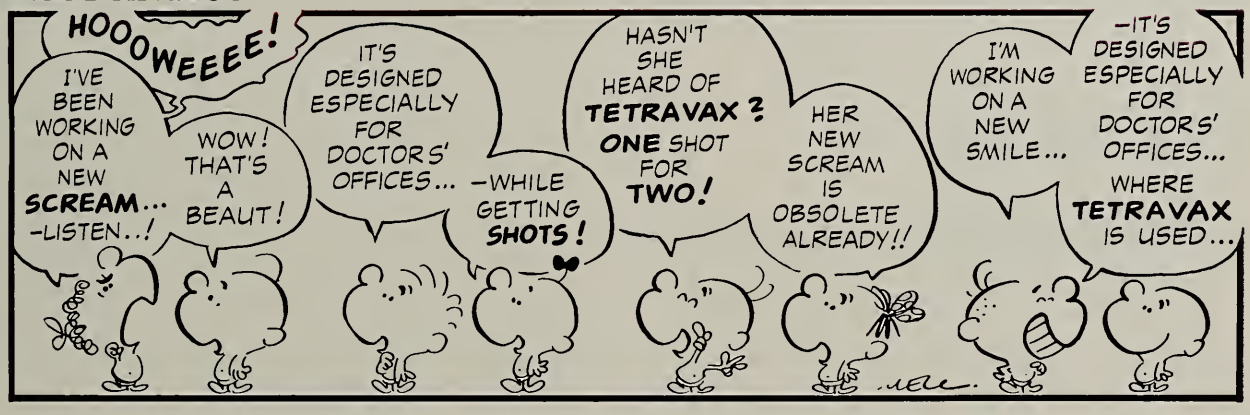
He was a member of the American College of Surgeons, the American Medical Association, the Minnesota State Medical Association, the Freeborn County

(Continued on Page A-84)

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FRANK GARRETT FOLKEN

(Continued from Page A-82)

Medical Society and was a Diplomat of the American Academy of Ophthalmology and Otorhinolaryngology.

He was a member of the Kiwanis Club, the Elks Lodge, the Masonic orders, the 40 and 8 and the American Legion. He was a past commander of the Legion. Immediate survivors are his wife, Rita; one daughter, Mrs. T. M. (Sue) Gill, and three grandchildren, John, Ann and Peter Gill; one brother, Heio Folken, Hastings, Nebraska and two sisters, Mrs. Hugo Alphers, Long Beach, California, and Mrs. Henry Henrichs, Allison, Iowa.

ARVID CLAUS LINDBERG

Dr. Arvid Claus Lindberg, a practicing Minneapolis physician for nearly forty years, died January 20, 1960, at the age of eighty-one years.

A native of Harris, Minnesota, Doctor Lindberg was graduated from the University of Minnesota Medical School in 1908. He was elected to honorary membership in Sigma Xi scientific fraternity.

He practiced general medicine in North Branch, Minnesota, until 1919. He then took postgraduate training in eye, ear, nose and throat diseases in New York and Washington. He opened his Minneapolis practice in 1921 and retired in his eightieth year.

Doctor Lindberg was a Life Member of the Minnesota State Medical Association. He was also a member of the Hennepin County Medical Society and the American Medical Association.

Survivors include a son, Dr. Winston, Minneapolis, and a brother, F. A. Lindberg, Harris.

ALBERT M. SNELL

Dr. Albert M. Snell, specialist in internal medicine, died in Palo Alto, California, on February 6, 1960, at the age of sixty-three years. Doctor Snell was born at Lake Park, Minnesota, and received the degree of Bachelor of Science in 1916 and that of Doctor of Medicine in 1918, from the University of Minnesota. He then served at the United States Naval Hospital at Great Lakes, Illinois, and was later medical officer of the U.S.S. *K. I. Luckenbach,* with the grade of lieutenant, junior grade.

Doctor Snell came to Rochester, Minnesota, on February 1, 1924, as a first assistant in medicine in the Mayo Clinic. He became a member of the staff of the Mayo Clinic on July 1, 1925, as a consultant in medicine, and in 1929, became head of a section of medicine in the Mayo Clinic and instructor in medicine in the Mayo Foundation, Graduate School, University of Minnesota. He was advanced to assistant professor in 1932, to associate professor in 1935 and to professor in 1939.

Doctor Snell entered into active service in the Medical Corps of the United States Naval Reserve on December 29, 1941, with the grade of commander. He was commended for meritorious service by the Secretary

of the Navy in 1946, and released from active duty on February 16, 1946, with the rank of captain. From 1946 to 1956, he was a member of the Professional Services Division and chief of a section in the Veterans Administration. He was vice chairman of the Professional Services Division in 1948 and chairman in 1953.

Doctor Snell left the Mayo Clinic in 1950 to go to the Palo Alto Clinic in Palo Alto, California. He became clinical professor of medicine in the University of California. He was a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association, the American Medical Association, the American Gastroenterological Association, American Society for Clinical Investigation, the Association of American Physicians, the American Association for Experimental Pathology, the Central Interurban Clinical Club, Minnesota Society of Internal Medicine, Minnesota Academy of Medicine, Society of Sigma Xi, Alpha Omega Alpha medical honor society, Alpha Kappa Kappa professional medical fraternity and the Alumni Association of the Mayo Foundation.

Doctor Snell was married to Miss Eleanor Shea on January 4, 1921; two sons and two daughters were born to them. They are: Major Willard Snell, U. S. Marine Corps, Camp Pendleton, California; Barbara (Mrs. Malcolm McCarthy), of Hillsborough, California; Thomas Snell, of Madrid, Spain; and Miss Susan Snell.

Doctor Snell was married to Miss Alice I. Morrow on November 11, 1944. Mrs. Snell and a son, David, of Palo Alto, survive.

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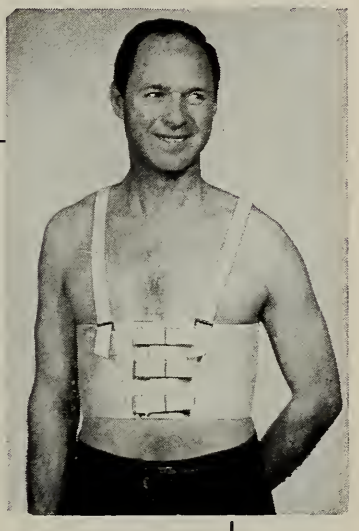


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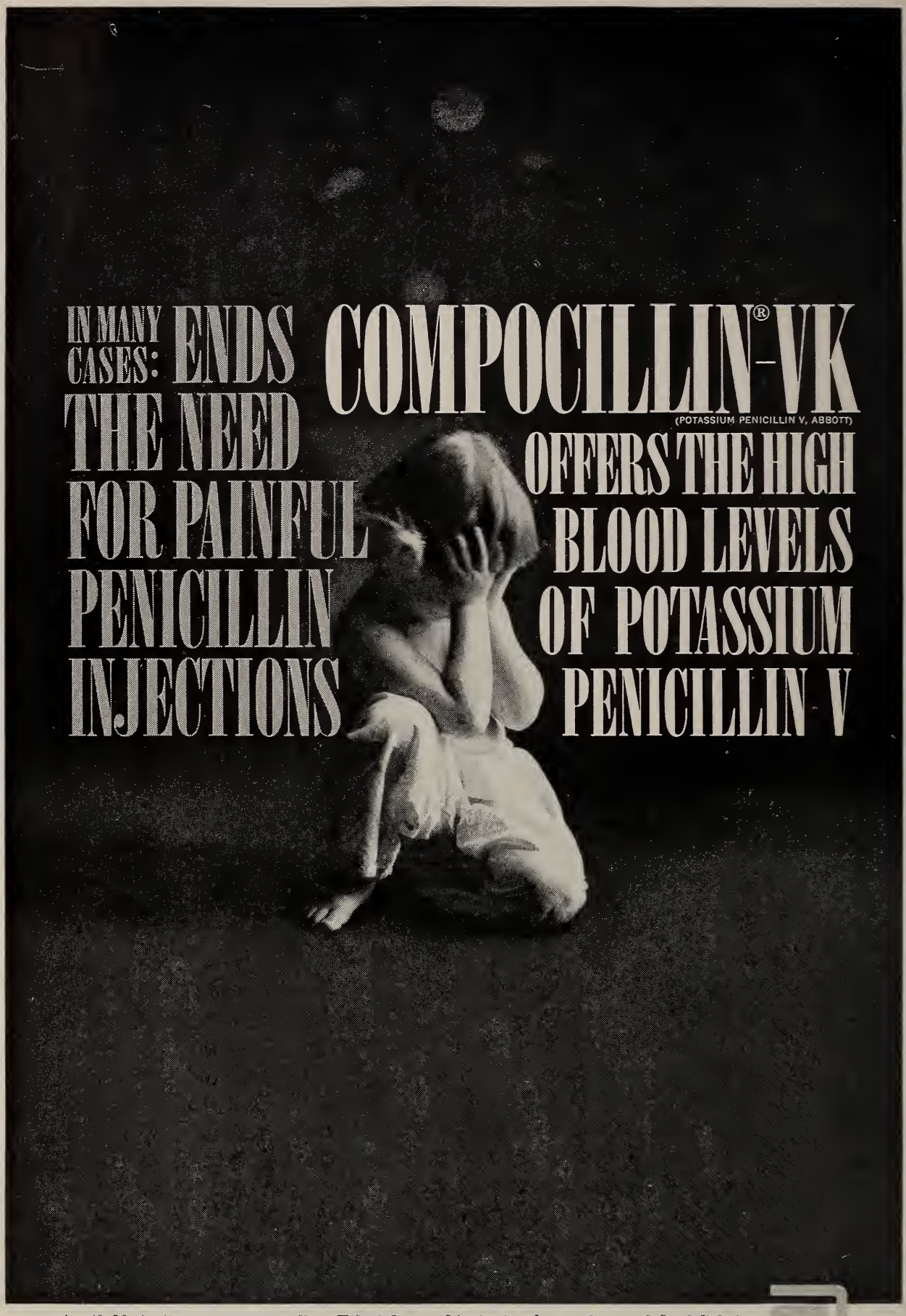
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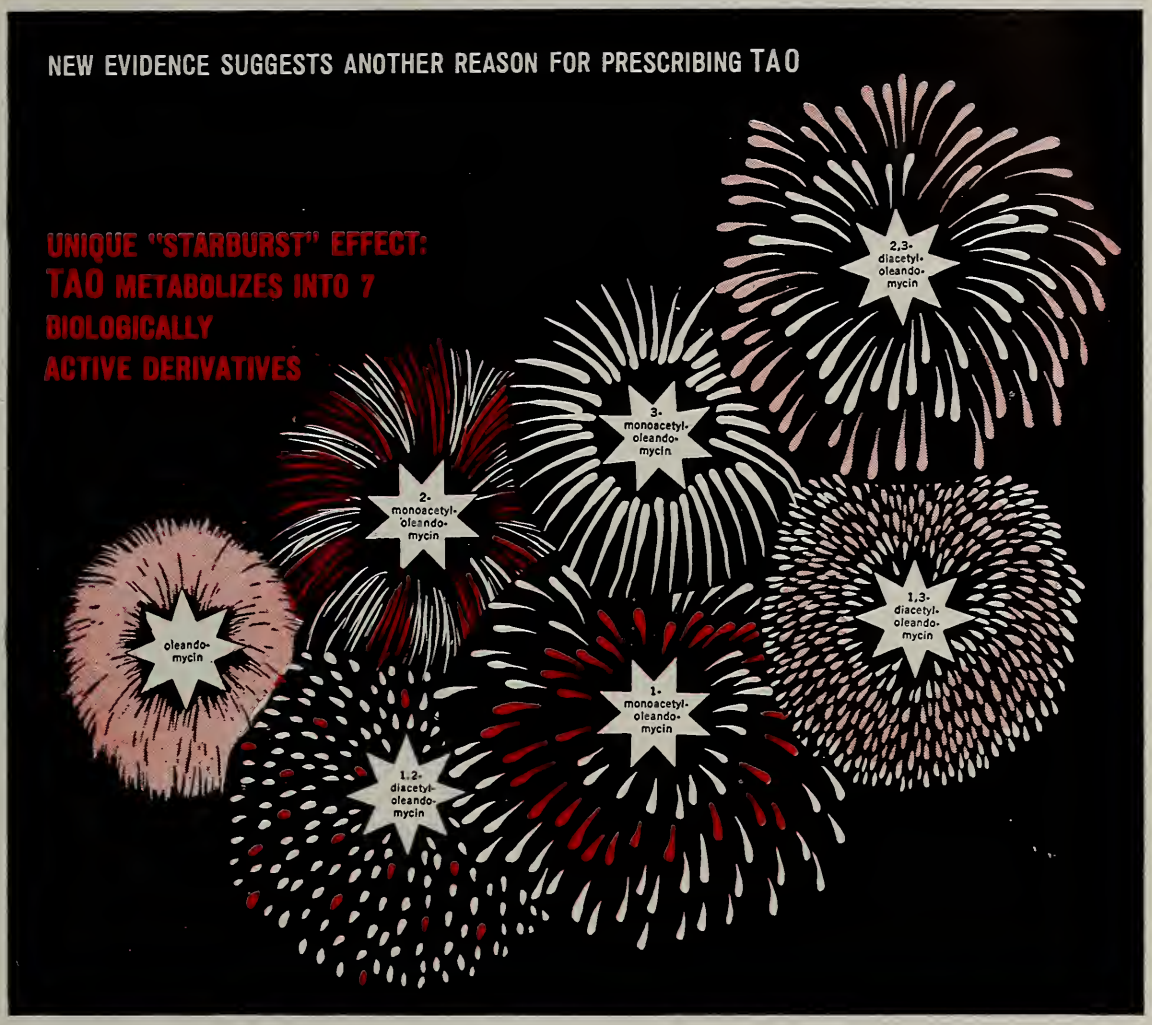


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1. English, A. R., and McBride, T. J.: Proc. Soc. Exper. Biol. & Med. 100:880 (Apr.) 1959. 2. Celmer, W. D.: Antibiotics Annual 1958-1959, New York, Medical Encyclopedia, Inc., 1959, p. 277. 3. English, A. R., and Fink, F. C.: Antibiotics & Chemother. 8:420 (Aug.) 1958.

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The Physician's Diary

The Moose Lake Village Council met recently at the first meeting of the new year. At the meeting the Council named **Dr. Thomas Moe, Dr. A. Sach-Rowitz, Dr. R. F. Kolosky, Dr. L. J. Stella,** and **Dr. M. S. Munson** to the Board of Health. Doctor Moe was also appointed Chairman of the Board.

* * *

The newly formed District I Hospital of Faribault recently elected **Dr. Donald J. Studer** of Faribault as Chief of Staff. Doctor Ttuder was elected, upon recommendation of the nominating committee of the Staff, by physicians who have made application and received appointment to the Staff from the Board of Trustees.

* * *

The Loretto and Union Hospital staffs of New Ulm recently elected **Dr. William J. Muesing,** as President of both staffs. Also receiving posts at the two hospitals was **Dr. Joseph W. Burnett,** New Ulm. Doctor Burnett was elected Vice President of the Union Staff and Secretary of Loretto. **Dr. Frank J. Carthey** was elected Vice President at Loretto and **Dr. C. A. Saffert,** Secretary at Union.

* * *

Dr. John S. Pearson, Mayo Clinic, has been appointed by the State Board of Health to an Advisory Committee on Human Genetics. Other members are **Dr. Sheldon C. Reed,** Dight Institute; **Dr. John A. Anderson, Dr. John E. Anderson, Dr. Ray Anderson, Dr. Robert Gorlin,** and **Dr. E. Adamson Hoebel,** University of Minnesota, and **Dr. Tague Chisholm,** Minneapolis.

* * *

Members of the Board of Health of New Ulm were recently appointed. They include **Dr. C. A. Saffert,** Health Officer; **Dr. H. A. Vogel** and **Dr. William A. Black,** members, one year term.

* * *

Dr. Malcolm A. McCannel, Minneapolis, recently announced the association of **Dr. Charles E. Tesar** and **Dr. Russell A. Thompson** in the practice of Ophthalmology and Ophthalmic Surgery.

* * *

Rochester physician, **Dr. Charles Mayo,** recently addressed a group of 800 persons. They were attending the 75th Annual Meeting of the Aberdeen, South Dakota, Chamber of Commerce. Doctor Mayo spoke on the two sides of alleged high medical costs.

* * *

The new president of the Southwest Medical Society is **Dr. Hugh D. Patterson** of Slayton. Other officers recently installed include **Dr. O. M. Heiberg,** Worthington, secretary; **Dr. B. N. Karleen,** Jackson, president-elect; and **Dr. R. K. Minge,** Worthington, vice president.

* * *

The Minnesota Association for Retarded Children honored **Dr. Dale C. Cameron** at a noon luncheon recently. **Dr. Donald Berglund,** Northfield, presented Dr. Cameron with a certificate of appreciation for his work with retarded children.

Dr. Nelson Bradley, retiring superintendent of the Willmar State Hospital, was recently honored by employes of that Hospital at a farewell party. Dr. Bradley received a plaque commending him on his work in Minnesota and it expressed regret at his leaving. It was signed by Orville Freeman, Governor of Minnesota.

* * *

The Olmsted Medical Group recently held its annual partnership meeting. At the meeting, **Dr. Harold A. Wente** was chosen to succeed **Dr. J. E. Verby** as president of the Group. Other officers are **Dr. W. R. Weyhrauch,** vice president; **Dr. J. C. Brodhun,** secretary-treasurer; and Dr. Verby, trustee.

* * *

The position as Superintendent of Willmar State Hospital left vacant by **Dr. Nelson J. Bradley** was filled recently. **Dr. Vera Mather Behrendt** of Rhode Island accepted that position and began duties on February 3.

* * *

The Miller Memorial Hospital of Duluth at its recent annual medical staff meeting, installed the new chief of staff. He is **Dr. H. J. Walder,** Duluth. Dr. Walder succeeds **Dr. K. A. Storsteen** who becomes a member of the executive committee. Other new officers are **Dr. H. E. Bakkila,** vice chief of staff; **Dr. J. J. Halbert,** staff secretary; and **Dr. Dwight Hoeg,** a member of the executive committee. **Dr. Mario Fischer,** Duluth, was named ex-officio member of the executive committee.

* * *

Dr. John C. Brodhun, Olmsted Medical group member, recently attended an officers conference for component chapters of the Southern Minnesota Chapter of the Minnesota Academy of General Practice. Doctor Brodhun is vice president of the Southern Minnesota Chapter. Other officers of the Chapter are **Dr. Dale J. Hawk,** St. Charles, president; **Dr. D. W. Sontag,** Lake City, secretary-treasurer; **Dr. John O. Fluegel,** Rochester, program chairman; and **Dr. Sam McHutchison,** St. Charles, delegate.

* * *

The new Chief of Staff of the Owatonna City Hospital is **Dr. Theodore J. Stransky** of Owatonna. He succeeds **Dr. John A. McIntyre.** Other officers elected were **Dr. Donald H. Dewey,** vice president of the staff; and **Dr. James McEnaney,** secretary. Outgoing officers include **Dr. D. H. Honath,** vice president; and **Dr. D. K. Halvorsen,** secretary.

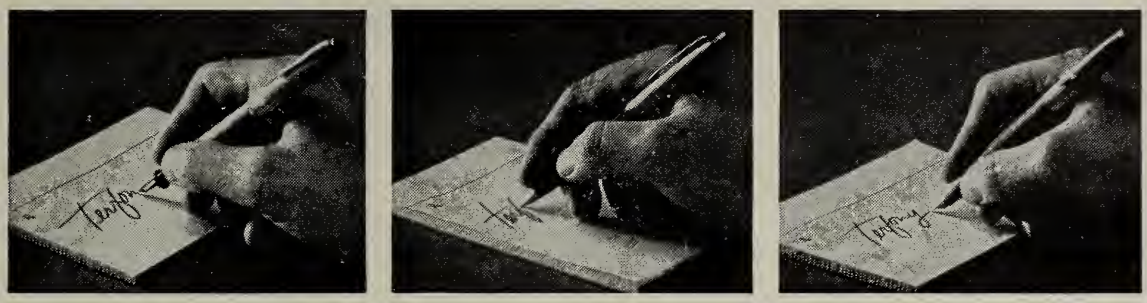
* * *

University of Minnesota heart surgeon, **Dr. C. Walton Lillehei,** left for Europe recently to give a series of lectures on open heart surgery at medical centers in England and Germany.

* * *

The medical staff of St. Joseph's Hospital, Mankato, recently elected **Dr. R. A. Sanford** president of the staff. Doctor Sanford will serve through 1960. Elected vice

(Continued on Page A-90)



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(Continued from Page A-88)

president was **Dr. J. L. Marso** and secretary, **Dr. H. J. Setzer.** Outgoing officers are **Dr. J. T. Olive,** president; **Dr. P. H. Gislason,** vice president, and **Dr. A. M. Scheidel,** secretary. Reappointed to the executive committee were **Dr. M. I. Howard, Dr. A. A. Schmitz** and **Dr. J. C. Von Drasek.**

* * *

Dr. George D. Haggard, Minneapolis physician, recently celebrated his one hundred and third birthday. The Minneapolis physician had an active practice until 1953 when he retired.

* * *

Awards of research grants totaling $18,000 to seven Minnesota doctors by the Minnesota Chapter of the Arthritis and Rheumatism Foundation were announced recently. Among the recipients were **Dr. Paul J. Bilka,** Minneapolis, who received $2,000 for a medical teaching film on physical examination of arthritis patients, and **Dr. John M. Wolff,** Duluth, $500 for analysis of synovial fluid in patients with rheumatoid arthritis.

* * *

The Assistant Superintendent of the Rochester State Hospital since 1947, **Dr. Jorge A. Lazarte,** resigned recently. Doctor Lazarte will become Associate Professor of Psychiatry in the Medical College of Alabama, Birmingham. Doctor Lazarte is the second of the three top medical staff members who have left the institution.

* * *

The Hutchinson Jaycees recently awarded **Dr. Carl O. Bretzke** the Jaycee Distinguished Service Award as the "Outstanding Young Man of 1959." Doctor Bretzke is one of the founders of the Hutchinson Medical Center. He has served as Secretary of the McLeod County Medical Society for two years and has also been Chief of Staff of Hutchinson Community Hospital for two years.

* * *

The Columbia Heights Record recently announced that **Dr. Thomas J. Meany** and **Dr. Patrick C. Meekin,** physicians and surgeons, opened their offices at 425 40th Avenue, N.E. The doctors occupy a ten-room clinic above a drug store.

* * *

Dr. W. R. Koons, Mahnomen, recently moved his offices to the new professional building in Mahnomen. The area used by Dr. Koons contains nine rooms, which are serving as a lobby-waiting room, a business office, private office, laboratory room, minor surgery room, x-ray room, a physical therapy room and two examining rooms and treatment rooms.

* * *

Members of the Elizabeth Eliot Club of Unity (Unitarian) church heard **Dr. Dwight L. Martin** speak on the subject of "Maintaining Your Health."

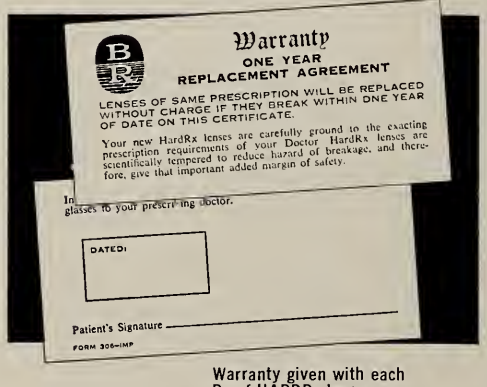
* * *

A general practitioner from Minneapolis, **Dr. James Pattee,** was recently elected chief of staff of Glenwood Hills Hospital at the annual joint meeting of the 150-doctor staff and hospital board of trustees. **Dr. Robert Nolan,** an obstetrician, was elected vice chief of staff

(Continued on Page A-92)

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(1) Estimate based on epidemiologic study by Van Volkenburgh, V. A., and Frost, W. H.: Am. J. Hygiene 71:122, Jan. 1933.

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(Continued from Page A-90)

and **Dr. James H. Lyons,** a psychiatrist, was named secretary-treasurer.

* * *

The Biwabik Order of Oddfellows has offered their building to secure an independent resident physician for the town of Biwabik. The Chamber of Commerce has been interviewing physicians for that position since **Dr. S. C. Blackmore** announced the closing of his office.

* * *

Dr. Edward A. Boyden, emeritus professor of anatomy at the University of Minnesota, was among ten American medical doctors given distinguished achievement awards recently for exceptional contributions to world medical progress. Doctor Boyden is currently resident professor of anatomy at the University of Washington.

* * *

The U. S. Public Health Service has appointed **Dr. Howard P. Rome,** professor of psychiatry at the University of Minnesota's Graduate School of Medicine, Rochester, to serve a three-year term on the Selection Committee for the Senior Research Fellowship program of the National Institute of Health. Doctor Rome will advise and make recommendations to the surgeon general on the selection of qualified persons for the five-year fellowships.

* * *

Dr. C. F. Wohlrabe has been appointed health officer of North Mankato, it was announced recently. The appointment took place at the Organizational Meeting of the City Council of North Mankato.

A former member of the Mayo Clinic staff, **Dr. C. R. Holland** has opened private offices as a physician and surgeon at 512 2nd Avenue S.W., in Rochester. Doctor Holland was a consulting physician in the emergency and admitting rooms at St. Mary's Hospital until July, 1959.

* * *

The Winona County Medical Society re-elected **Dr. L. J. Wilson** as its president recently. The election took place at a business meeting conducted in conjunction with a joint session with the society's auxiliary. **Dr. L. F. Johnston** was elected secretary-treasurer to succeed **Dr. C. W. Rogers. Dr. Warren W. Haesly** was re-named vice president and **Dr. L. I. Younger** was renamed delegate to the state assembly, with **Dr. F. J. Vollmer** as alternate. New director for two years is **Dr. Sam K. McHutchison** of St. Charles. **Dr. James V. Testor** of Winona General Hospital spoke on hazards of radiation.

* * *

Appointments announced at the meeting of the Mora Village Council included **Dr. A. C. Peterson** as Health Officer, **Dr. H. L. Berge** to the Utilities Committee, and **Dr. W. Nordman** to the Airport Commission.

* * *

Dr. L. R. Parson of Elbow Lake has announced his retirement. Doctor Parson is retiring after nearly forty years of active practice as a general practitioner.

* * *

Among speakers at the recent Winter Seminar of the Minnesota Academy of General Practice at St. John's University at Collegeville were **Dr. B. Marden Black,**

(Continued on Page A-94)

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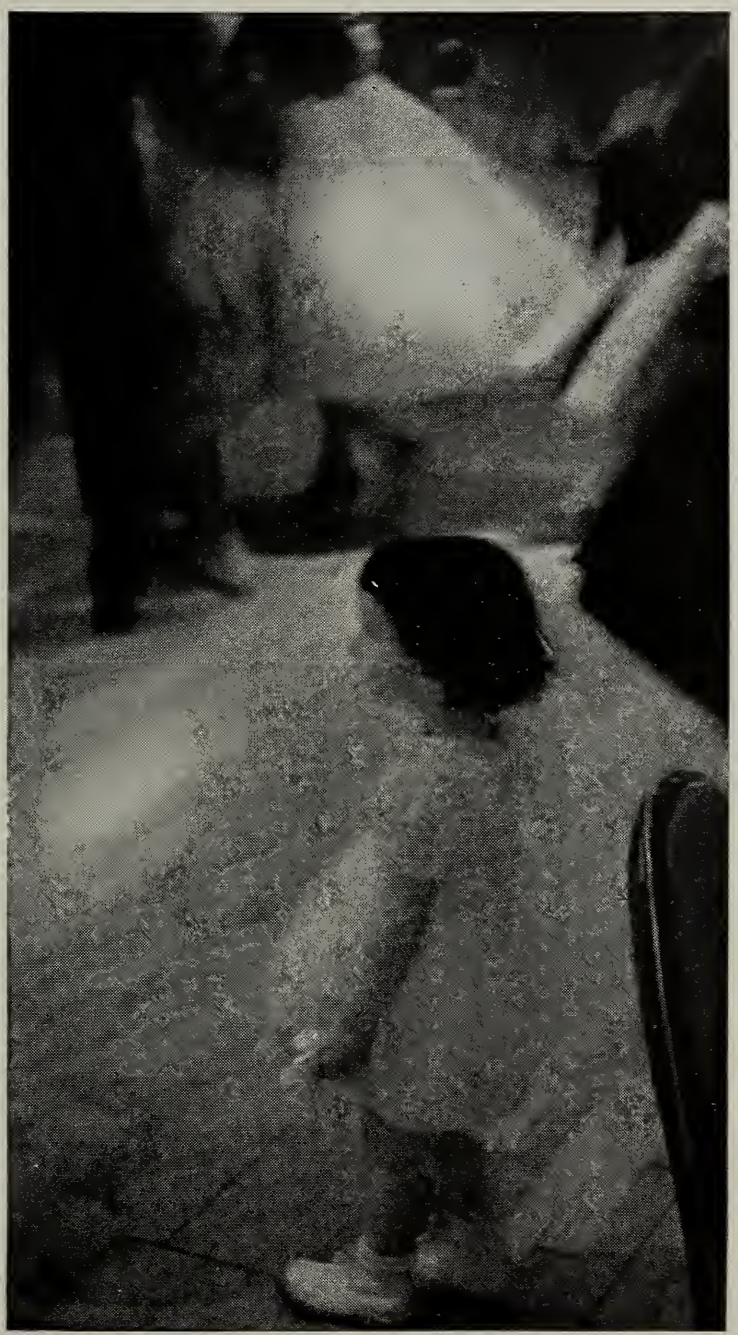
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(Continued from Page A-92)

professor of surgery at the Mayo Foundation; **Dr. Lyle J. Hay** and **Dr. Robert L. Vernier** of the University of Minnesota.

* * *

Dr. H. M. St. Cyr has been elected chief of staff at North Memorial Hospital in Robbinsdale. Other officers include **Dr. D. B. Simonson,** chief of staff elect and **Dr. R. J. Rotenberg,** secretary-treasurer.

* * *

Mount Sinai Hospital of Minneapolis has announced the election of **Dr. David Gaviser** as president of the medical staff for 1960. Other officers are **Dr. Earl Hill,** vice president and **Dr. Norman Bloom,** secretary-treasurer. **Dr. Isadore Fisher** and **Dr. Samuel Feinberg** were elected to the executive committee.

* * *

Dr. Philip H. Soucheray, St. Paul, announced the association of **Dr. Everett H. Karon** in the practice of internal medicine. Doctor Karon recently completed his Fellowship in internal medicine at the Mayo Clinic and is interested in diseases of the chest and allergy.

* * *

Head of the Section of Pediatrics of the Mayo Clinic, **Dr. James W. DuShane,** has been appointed to the Executive Committee of the American Heart Association. Doctor DuShane is also Chairman of the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association.

The St. Paul Surgical Society recently celebrated its 25th Anniversary at a banquet held at the Minnesota Club in St. Paul. **Dr. Justus Ohage** presented a gavel that had been constructed from oak paneling found during reconstruction of St. Joseph's Hospital in St. Paul, the paneling being in the operating room in which the first successful Cholecystectomy in North America was performed by Dr. Justus Ohage, Sr., on September 24, 1886. Guest speaker of the evening was **Dr. Steven Economou,** associate professor of surgery at the University of Illinois. His subject was "Chemotherapy and Prevention of Cancer."

* * *

"Misleading Calcific Shadows in the Abdomen," a scientific exhibit by **Dr. Lloyd G. Bartholomew, Dr. James C. Cain, Dr. George D. Davis** and **Dr. Arthur H. Bulbulian,** all of the Mayo Clinic, was given first award at the recent annual meeting of the Interstate Postgraduate Medical Association in Chicago. Drs. Cain and Bartholomew are consultants in medicine; Dr. Davis is a consultant in diagnostic roentgenology, and Dr. Bulbulian is director of the Mayo Foundation Museum of Hygiene and Medicine.

* * *

The medical staff of Olmsted Community Hospital recently elected officers. Named president of the group was **Dr. John C. Brodhun. Dr. Theodore Wellner** is vice president and **Dr. John O. Fluegel** was elected secretary-treasurer.

(Continued on Page A-96)



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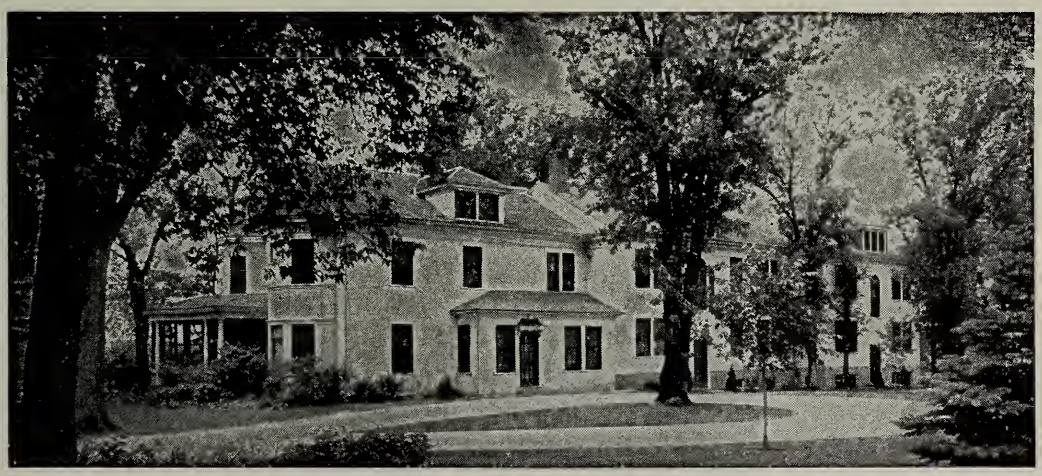
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(Continued from Page A-94)

Dr. Robert P. Koenig has announced the opening of an office at 410 Granite Exchange Building in St. Cloud. Doctor Koenig will limit his practice entirely to general ophthalmology and surgery of the eyes.

* * *

The Naeve Hospital of Albert Lea has announced the election of **Dr. T. M. Gill** as chief of the medical staff. Doctor Gill began his duties at the beginning of the year.

* * *

A Minneapolis physician, **Dr. David C. Halvorson,** has announced that he is now associated with **Dr. Warren E. Wilson and Dr. Bernard Street** of Northfield in the practice of medicine and surgery.

* * *

Dr. Cyrus Owen Hansen, Minneapolis, has been elected a fellow of the American College of Radiology for outstanding contributions and service to radiology. He received the fellowship degree at a convocation recently in New Orleans, Louisiana.

* * *

Elbow Lake, Minnesota, has a new physician. He is **Dr. Dale C. Lindquist.** Doctor Lindquist will enter a partnership with **Dr. V. A. Doms** and **Dr. C. F. Peikert,** at the Elbow Lake Clinic.

* * *

Dr. John Hetzler will begin practice in Pine Island, Minnesota, on or about July 1, 1960. The community of Pine Island is building a new doctor's office for thei new physician. The building is expected to be ready fo occupancy when the physician arrives.

* * *

A former associate of **Dr. Paul A. Swedenburg** at th Swedenburg Clinic at Glenwood, **Dr. B. A. Kolp,** recently announced that he has opened his own office for th practice of medicine. Doctor Kolp will also practice i Glenwood.

* * *

Dr. R. Shin, formerly of Grand Meadow, recently opened offices in Howard Lake. Doctor Shin's office i in the same building that was occupied by **Dr. Thoma** of Howard Lake.

* * *

The Twin City Society of Pathologists was recently formally organized with the adoption of a Constitution and ByLaws at a meeting held on February 4, 1960. The purpose of this society is to advance the quality and knowledge of pathologists in the Minneapolis-St. Paul area, and to co-operate with state, national and international organizations of pathologists in maintaining the high standards of pathologists. The following officers were elected: president, **Dr. C. W. Freeman,** Minneapolis; vice president, **Dr. Wayne Chadbourn,** Minneapolis; president-elect, **Dr. Walter Subby,** Wayzata, and secretary-treasurer, **Dr. E. A. Hanske,** Minneapolis.

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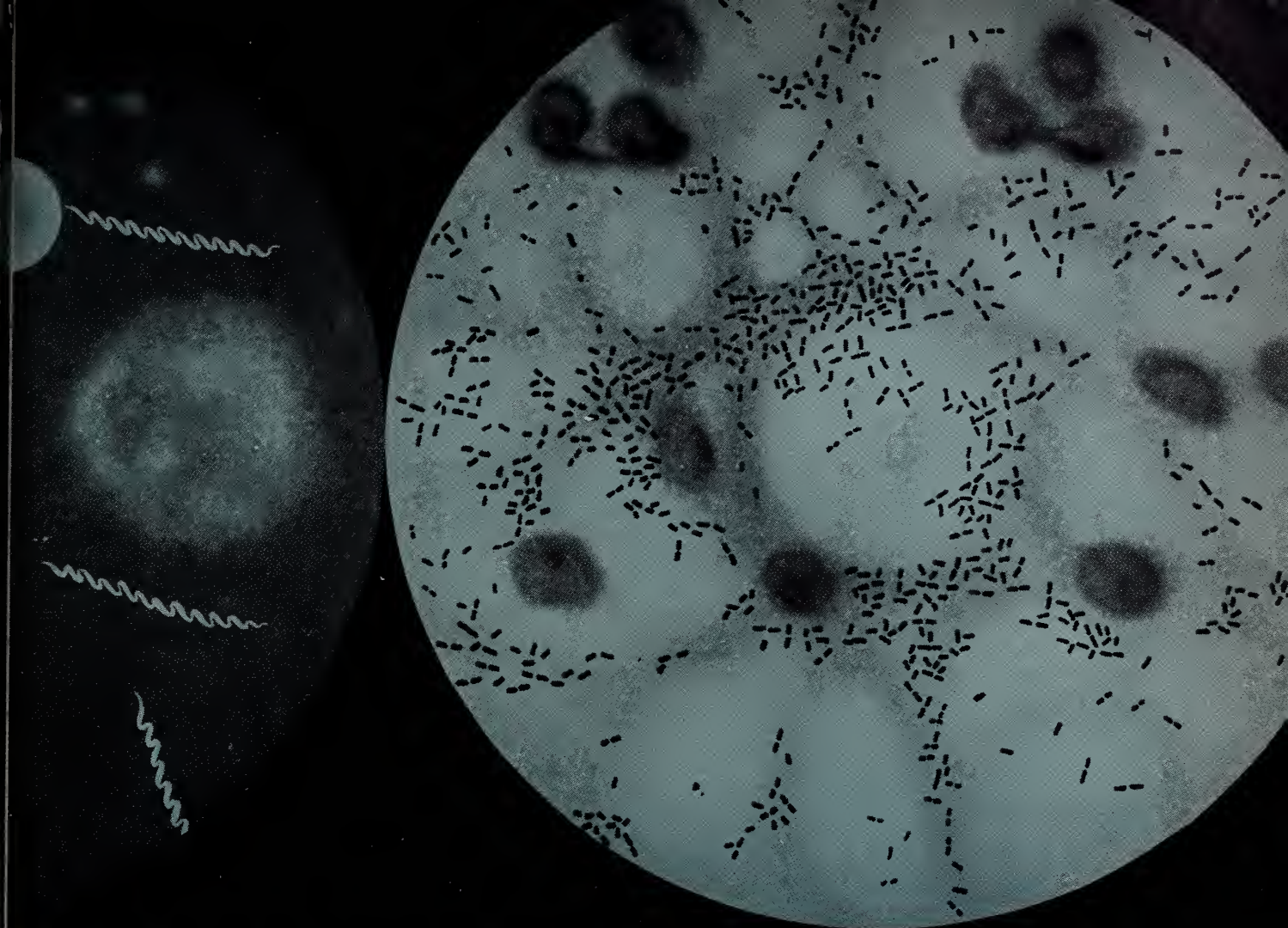
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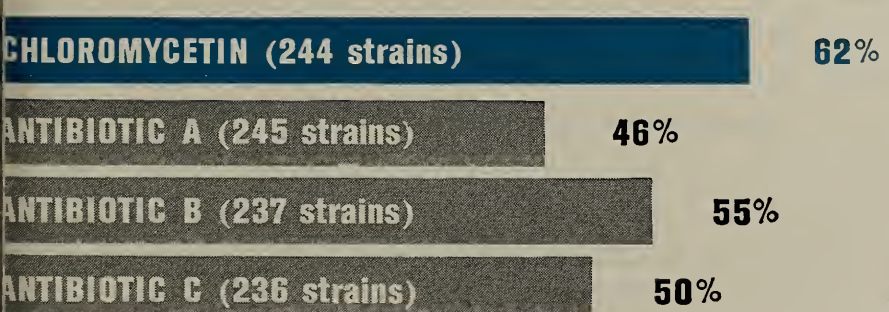
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ferences: (1) Morton, J. J.: *Yale J. Biol. & Med.* **31**:397, 1959. (2) Rogers, D. E., & Louria, D. B.: *New England J. Med.* **261**:86, 1959. Leming, B. H., Jr., & Flanigan, C., Jr., in Welch, H., & Marti-Ibañez, F.: Antibiotics Annual 1958-1959, New York, Medical Encyclo-lia, Inc., 1959, p. 414. (4) Edwards, T. S.: *Am. J. Ophth.* **48**:19, 1959. (5) Olarte, J., & de la Torre, J. A.: *Am. J. Trop. Med.* **18**:324, 1959. Suter, L. S., & Ulrich, E. W.: *Antibiotics & Chemother.* **9**:38, 1959. (7) Holloway, W. J., & Scott, E. G.: *Delaware M. J.* **30**:175, 1958.

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Cutaneous Reactions to Cosmetics and Related Substances

Here is an article which is not only of interest to the physician, but also to his wife. This paper awakens one to the hazards of skin irritation that are encountered in the woman's cosmetic drawer. Since men are using more of these preparations, neither sex is spared the disability produced by some of these substances. With so many new products appearing on the market, it would appear that greater study is required before their release to the public.

CARL W. LAYMON, M.D.
Minneapolis, Minnesota

From the Department of Dermatology, Minneapolis General Hospital, Carl W. Laymon, M.D., Director; and the Division of Dermatology, University of Minnesota, Francis W. Lynch, M.D., Director.
Presented at a postgraduate course for pharmacists, University of Minnesota, February 3, 1959.

COSMETICS, in all probability, would be used by fewer people if the possible risks of cutaneous reaction were known. Knowledge, however, does not seem to inhibit the desire to appear more beautiful. It is surprising that there are so few harmful dermatologic effects considering the world wide use of these products.

Hair and Scalp

Permanent waving requires softening of the hair with an alkaline sulfide followed by heat setting and then rinsing, or a cold process with thioglycolate followed by an oxidizer. Cold wave chemicals are usually innocuous, the beauty operator standing greater hazard than her client. The possibility of allergic response to wetting agents and perfume ingredients always exists, as well as to the essential waving chemicals. Ammonium thioglycolate in the concentration advised for home waving is seldom harmful if used according to directions. If the softening solution is applied too long or too concentrated, the hair may break off producing temporary baldness even without dermatitis followed by normal regrowth. Sataloff and Wilson (1951)[1] reported that a permanent wave solution ran into an ear canal and perforated the drum. Increase of education and regulations for operators of barber and beauty shops has minimized the dangers for the patrons but has not helped the operators. The dangerous agents may be classed as mechanical or chemical. The use of metal clips, plastic combs and brushes tends to break the hair. Metal may cause dermatitis, especially in the occipital area. As regards the chemicals, most of the dangerous or irritating ones have been removed by the industry but it is impossible to remove all of the sensitizing substances. Both thioglycerol and ammonium thioglycolate, which are used in cold waving processes, have an irritating plus a sensitizing action. Thioglycerol is a more potent sensitizer than ammonium thioglycolate.

Hair lacquers for upsweep coiffures may cause dermatitis of the ears, neck and eyelids. Howell (1943)[2] reported twenty-one cases of dermatitis due to hair lacquer within a few weeks. Most of

these women used lacquer pads. Most of Howell's patients, when patch tested, were found sensitive to only one brand of hair lacquer. Several of the patients who developed dermatitis due to the pads had used liquid hair lacquer for several years. Schwartz (1943)[3] reported that the irritant agent in lacquer pads was a synthetic resin made from a combination of resin and fumaric acid. These are the same compounds which are used in ordinary shellac.

Hair dyeing with synthetic organic dyes of the paraphenylenediamine group was apparently discovered about 1880 according to Thomas (1950).[4] This group of chemicals contains potent sensitizers. Sensitization is slow to develop and patch tests should be performed prior to each application even in persons who have not previously reacted. Hair dyes have produced much less dermatitis since 1937 than before that time because of improvements in their manufacture, the prophetic patch tests and instructions on the packaging requesting predyeing open patch testing regulated by law. The modern paraphenylenediamine dyes are not unduly hazardous. Many cases of dermatitis of the scalp, face, ears and neck have been reported, however, due to these dyes. The use of them in dyeing eyelashes and eyebrows has occasionally resulted in extremely severe dermatitis with eye involvement, which in a few cases has led to complete blindness. An eyelid cosmetic known as "Lash Lure" caused many cases of dermatitis several years ago. The dyes in certain lipsticks have been known to cause cheilitis.

Hair bleaches, usually containing ammonia and peroxide, have produced primary chemical irritation as well as sensitization dermatitis. Chemical burns from hair straighteners usually cause areas of complete depigmentation. This is most commonly seen in colored people.

The sensitizers in scalp cosmetics are numerous —the essential oils of bay rum, the synthetic perfumes of brilliantine and the various oils and gum resins in hair creams and curling applications. The many scalp lotions and tonics, despite ridicule, are still popular with the male sex. They contain irritants and sensitizers, for example, pilocarpine, cantharides, quinine, acetic acid, camphor, capsicum, betanaphthol, resorcinol, chlorohydrate, rose mary oil, bergamot oil and numerous other essential oils and chemicals. Shampoos have a tremendous popularity and contain perfume and sulfonated mixtures which may sensitize a susceptible person. The coconut oil shampoos are perfumed with several stable and synthetic and essential oils. Recently a medicated shampoo containing selenium sulfide enjoyed tremendous popularity and has been widely prescribed by physicians for seborrheic dermatitis. Grover (1956)[5] reported diffuse hair loss associated with the use of this product in six women. All of the women had used the shampoo at one- to four-week intervals for varying periods. Hair loss could not be correlated with administration of any other local or systemic medication. In all cases the hair loss stopped within a week or two after the use of the shampoo was discontinued. Grover thought that the falling hair in these women represented toxic effects of absorption of the selenium ion. An analogy was drawn with the hair loss in livestock with chronic selenium intoxication.

It should be noted also that hair oils and greasy pomades can cause aggravation of acne vulgaris and seborrheic dermatitis of the face. The same holds true for greasy applications applied directly to the face such as "make-up bases."

Face

The same remarks concerning oils, tonics, creams, lotions and pomades used on the scalp also apply to similar preparations applied to the face. Time does not permit mentioning the innumerable sensitizers which are contained in these cosmetics. In addition to the other preparations, liquid and cake rouge and face powder must be added to the list of possible causes of dermatitis.

Perhaps the use of so-called hormone creams containing estrogenic substances should be mentioned. There is no scientific evidence that the use of estrogenic creams will prevent the natural aging of the skin, let alone produce any type of rejuvenation.

Some perfumes and cologne waters contain essential oils which lead to photosensitization. Women usually apply these cosmetics behind the ears and on the sides of the neck, and following exposure to actinic rays a dermatitis develops on the area where the perfume or toilet water has been applied. After the active dermatitis subsides there may be persistent pigmentation.

Dermatitis of the face may be due to nail polish. The eyelids, chin and sides of the neck are the areas which are usually involved. Syn-

thetic formaldehyde sulfonamide resins are potent sensitizers and are the excitants of the eruption. Nail lacquer dermatitis rarely affects the hands. Involvement of the vulva and perianal region, however, is possible in a person who is sensitive to nail lacquer. A patient with any pruritic dermatosis is well advised to omit nail lacquer until her skin is clear, for where she itches she will scratch and where she scratches she will develop the dermatitis as a complication. Group sensitization to the chemicals in nail lacquer is frequent and people who have nail polish dermatitis may be sensitive to sulfonamides and formaldehyde.

Hands

Soaps are alkaline to a greater or lesser degree and are defatting agents, lacking which capacity they could not cleanse. Skins are variable with respect to the amount of soap usage they can withstand. Hands that may be soaped twenty times a day in the warm summer time may tolerate only half a dozen washings in the winter when the air is dry, the skin cool and the sebaceous secretions diminished. Soaps and detergents are frequently the inciting cause of dermatitis of the hands. A skin which is already inflamed tolerates soap poorly. Any soap contains many ingredients, each one of which may be irritating or sensitizing. Many a patient imagines that water alone is the cause of her soap trouble. As Sutton (1956)[6] aptly stated, however, about three-quarters of the human body is water and a person intolerant of water would indeed be in trouble. Superfatted soaps, of which there are many on the market, may be of some value in lowering the defatting capacity for these cleansing agents.

Several years ago base coats for finger nails which contained phenolformaldehyde resins and synthetic rubber in methylethyl ketone caused hypertrophy of the nail bed and onycholysis without indications of inflammation. These products, however, have been removed from the market. Allergy did not seem to be the explanation of these changes.

Sunburn Preventatives and Substances Used to Enhance Suntan

It is well known that persons differ in susceptibility to active rays, blondes being especially sensitive. There are many sun filters on the market. Dark red petrolatum was used in the Armed Services for flyers in the Pacific Area. It was effective. Paraminobenzoic acid (15 per cent) is said to protect against rays of 2900 to 3100 Angstrom units. Å-Fil, a proprietary manufactured by the Texas Pharmacal Company, contains 5 per cent each of menthyl anthralinate and titanium dioxide. It is a good sun screen. Tannic acid has also been used. Neo-Å-Fil (Texas Pharmacal Company) contains 3 per cent digalloyltrioleate in a vanishing cream base. It is said to block completely solar radiation from 2900 to 3150 Angstrom units. Some of the agents incorporated in sun screen products may produce photosensitization. Contact dermatitis can result from any one or a combination of the chemicals contained in these preparations.

The antihistaminic drug, Pyribenzamine, is said to inhibit sunburn because the absorption curve of the chemical has a high extinction peak in the erythemogenic part of the spectrum. This was shown by Kline and Baer (1948).[7] The antimalarial drugs, especially atrabine and chloroquin have been used in the treatment of lupus erythematosus and various eruptions associated with hypersensitivity to actinic rays. The effect is believed due to the ability of these substances to restore the adaptability of the skin to ultraviolet radiation. There is increasing experimental evidence that chloroquin not only reduces ultraviolet erythema but certain other inflammatory reactions in the skin as well. Also to be considered as an effective contributing factor in reducing cutaneous reaction to ultraviolet light is the thickening of the stratum corneum. Cahn and his co-workers (1954)[8] suggested, on the basis of their studies, that chloroquin produces its effects by modifying the reaction of the patient, so that abnormal responses to ultraviolet light are suppressed but not the normal ones. The work of Cahn et al adds evidence that a seemingly obvious explanation is not correct; that is, that deposition of antimalarial drugs in the upper layers of the skin acts to filter out the effective rays of ultraviolet light. These drugs, however, are not to be recommended to patients for obtaining a better suntan.

Following the introduction of psoralens into this country for the treatment of vitiligo, there was an observed increased melanin pigmentation and tolerance to sunlight in the nondiseased areas of some patients with vitiligo who were taking this drug and exposing themselves to sunlight. This led to preliminary trials of the preparation

in subjects with tendency to sunburn before tanning. Enthusiastic testimonial evidence was rapidly obtained from users of the material who claimed reduced sunburn and increased tanning. Laboratory and field trials indicated that pigmentation responses to sun could be augmented in human subjects with either topical or oral use of the psoralens. That tolerance to sun and capacity to develop a healthy looking tan are associated with various value systems in our culture is confirmed by the many letters received from patients pleading for increased tolerance or a better tan. Daniels (1958)[9] and his co-workers undertook a double blind control study of burning and tanning effects of the drug. Ten mg. of methoxyline was taken two hours before exposure to sun. The results were compared to the reactions in patients who took a mild sugar placebo. After taking the placebos some of the patients stated: "Tanner than ever before," "Stayed out whole days without burning," "Increasing exposure and increasing drug dose without any effect except more tan and no burn—wonderful." The study was not made in order to discredit the fact that methoxyline is a known potent photodynamic agent and the authors did not claim that the patients were reacting falsely to an inactive agent. They merely wanted to show that the testimonial type of data has a high inherent error. Arnold Jr. (1957)[10] also studied the psoralens and suntan. He found that the psoralens augmented sunburn response, shortened the time required for production and, other things being equal, increased its intensity and duration. The tan acquired may be of slightly different color or quality and perhaps more persistent than ordinary tan. He thought that the psoralens were valuable as agents to facilitate suntanning. He did not recommend their general use, however, and thought that they should be used only in a limited, closely supervised, experimental way in patients intelligent enough to be trusted with them. He also brought out the possibility that drugs which increase protective responses to light might also increase the carciogenic response. There has been insufficient time and study to decide this possibility.

Deodorants and Depilatories

The most common and distressing of the localized forms of hyperthrichosis is that which occurs on the face of women, with or without an associated excessive growth of hair on the arms, legs and chest. No internal treatment is effective in prophylaxis or cure. X-ray treatment is absolutely contraindicated. Temporary removal can be affected by shaving and by mechanical or chemical depilatories which are commercially available. The wax depilatories which mechanically remove the hair from the base of the shaft, and the corrosive ones, barium or calcium sulfide and the thioglycolates which destroy the exposed portions of the hair but do not penetrate far beneath the skin surface, are the ones used most commonly. These compounds can produce either folliculitis or contact dermatitis. Such irritations, however, must be extremely uncommon in view of the wide use which these products enjoy.

There are many different perfumes, waxes and astringent chemicals used in the multitude of deodorants which are on the market. Here too, contact dermatitis or folliculitis can result from these products. A new type of irritation in the axillas has been observed since stick deodorants came into extensive use. This manifests itself as a weeping, papular and extremely pruritic eruption with swelling, redness and burning. In these cases patch tests have been negative. Cosmetic companies have admitted that almost all of the stick deodorants contain sodium zirconium lactate. There have been many law suits as the result of eruptions developing from the stick deodorants.

In the management of cutaneous reactions to cosmetics, a sharply focused history is the most important in the search for possible causes. In many cases, the use of the patch test is an important aid. Patch testing, unless executed with knowledge and caution, however, may entail dangers. Many substances, if applied at the incorrect time, on the incorrect site, or in the incorrect concentration, or in the incorrect manner may produce both local and generalized reactions which can incapacitate the patient. For these reasons, it seems inadvisable to advocate the routine or extensive use of patch tests by the nonspecialist. It should be emphasized that the treatment of cutaneous reactions due to cosmetics and related substances requires scrupulous attention to detail on the part of the physician and the wholehearted cooperation on the part of the patient and of those who administer to the patient.

(References are on Page 259)

Subtotal Colectomy with Anal Ileostomy

A Two-Stage Procedure

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IN 1955, the authors[1] reported experiences with three one-stage subtotal colectomies with anal ileostomy as described by Ravitch.[2] Despite the long, stormy post-operative courses characterized by severe diarrhea, two of these cases were successful. The third patient developed a sloughing of the ileo-anal anastomosis necessitating eventual permanent abdominal ileostomy. This has been a common experience with such one-stage procedures. At that time a three-stage procedure aimed at circumventing these problems was introduced.

In 1957, the author[3] reported a two-stage procedure. The first stage consisted of a subtotal colectomy, pull-through anal ileostomy, and temporary proximal diversionary ileostomy. The anal-ileostomy was revised two days after the initial procedure. Three months after the initial surgery had elapsed, the patients had fully recovered, and the ileo-anal anastomosis had healed. If, at the end of this period, the patient was able to pass the continence test, an end-to-end ileo-ileostomy was performed.

This operation can be used in selected patients with ulcerative colitis. It can also be used in those cases of multiple polyposis of the colon with marked involvement of the terminal large bowel in whom one would ordinarily perform a total colectomy.

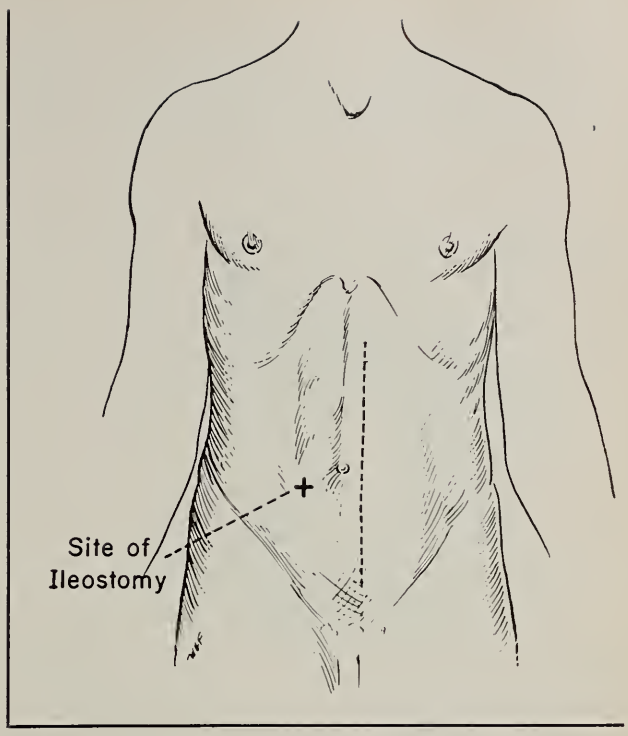


Fig. 1.

Presented as a colored motion picture with discussion before the St. Paul Surgical Society, September 16, 1959.

The illustrations, with some modifications, are from those appearing in AMA *Archives of Surgery*.

Operative Procedure

A Cantor tube is inserted prior to operation for long intestinal intubation to facilitate the surgery. With the patient in a supine position, the site of the ileostomy is marked. The patient is then placed in a lithotomy position and a long left paramedian incision is made (Fig. 1). This incision permits adequate exposure of the splenic flexure and pelvis, and leaves free the entire right lower quadrant for the site of the ileostomy.

The colon is completely mobilized before the mesenteric vessels are divided. However, when massive hemorrhage is the indication for colectomy, one should mobilize and section the blood supply to the colon starting in the right lower quadrant and proceding around to the left lower quadrant. To facilitate mobilization of the splenic flexure, the left half of the transverse colon is freed, and then the descending colon prior to mobilizing the splenic flexure.

The ileum is then transected near the cecum (Fig. 2). After occluding the colon about ten

inches proximal to the anus, the distal colon is irrigated thoroughly from below. Using a sponge forceps from below, a measured site approximately 4 inches proximal to the mucocutaneous junction is tagged, and the colon is transected at this location. If one preserves only the sphincters and their nerve supply, the patient will have sphincter control. For the patient to have continence also, however, it is necessary to preserve the muscularis and serosa of at least 2 to 3 inches of terminal large bowel together with its nerve supply.

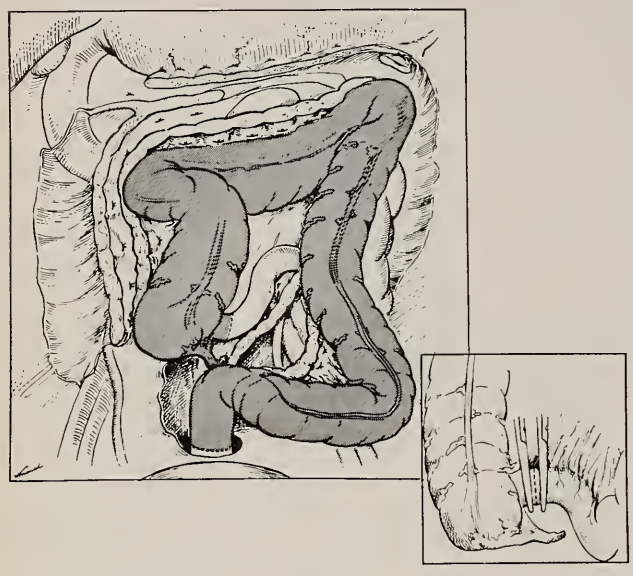


Fig. 2.

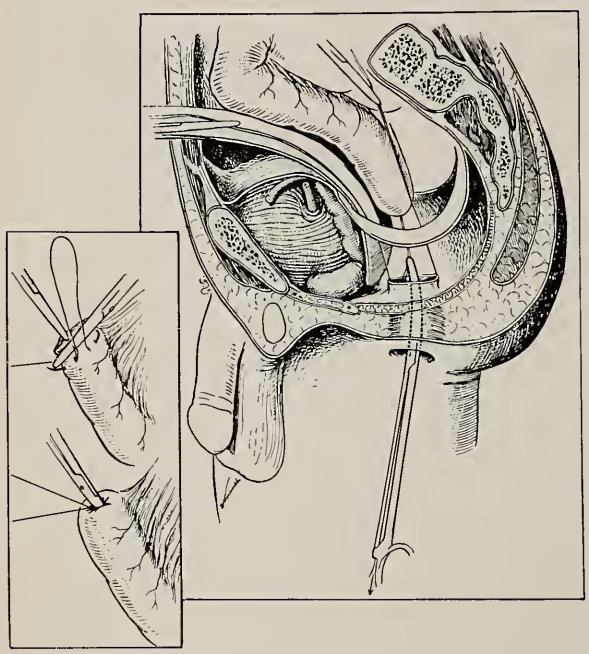


Fig. 3.

Curettage of the mucosa of the ano-rectal pouch is performed from below before transection of the colon distally. Sharp excision of the mucosa is inadvisable in patients with ulcerative colitis where scar formation makes such a procedure extremely difficult; on the other hand, excision of the mucosa is the method of choice in patients with multiple polyposis. In ulcerative colitis, it is unnecessary to remove all of the mucosa; in a patient in whom anal ileostomy was unsuccessful, an anal biopsy performed six months after colectomy revealed complete replacement of mucosa by granulation and fibrous tissue.

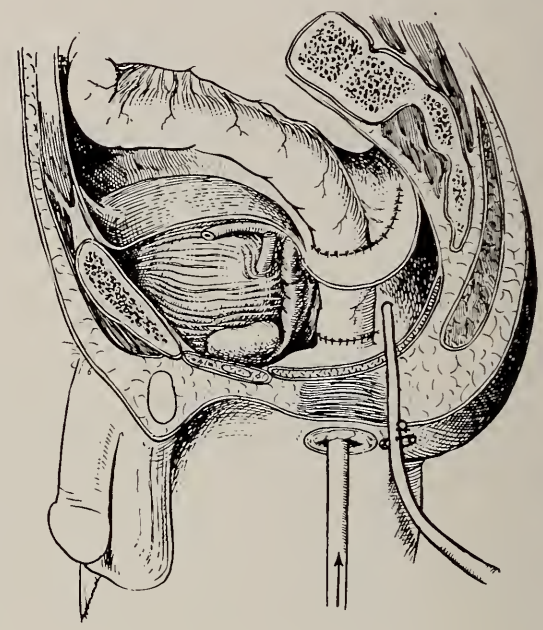


Fig. 4.

A simple purse-string suture is used to anchor the terminal ileum around a mushroom catheter prior to pull-through (Fig. 3). The catheter is inserted to prevent secretion of the ileum from bathing the terminal ileum when the latter is placed in the ano-rectal pouch. The terminal ileum is pulled through the ano-rectal pouch.

The ileum and its mesentery is sutured through the full-thickness of the proximal end of the ano-rectal cuff. The presacral space is drained lateral to the ano-rectal cuff through a lateral perineal stab wound as shown in Figure 4. The pelvic peritoneum is then sutured to the small bowel and to its mesentery.

The patient is now placed in a supine position. The ileum is transected with the precaution that

the segment to be defunctioned is sufficiently mobile for later re-anastomosis. The proximal functioning ileostomy is brought out through a right lower quadrant stab wound with excision of a small circle of skin. The mesentery of this segment is sutured to the anterior and right lateral parietal peritoneum to prevent internal herniation or prolapse. About 2 inches of ileum is

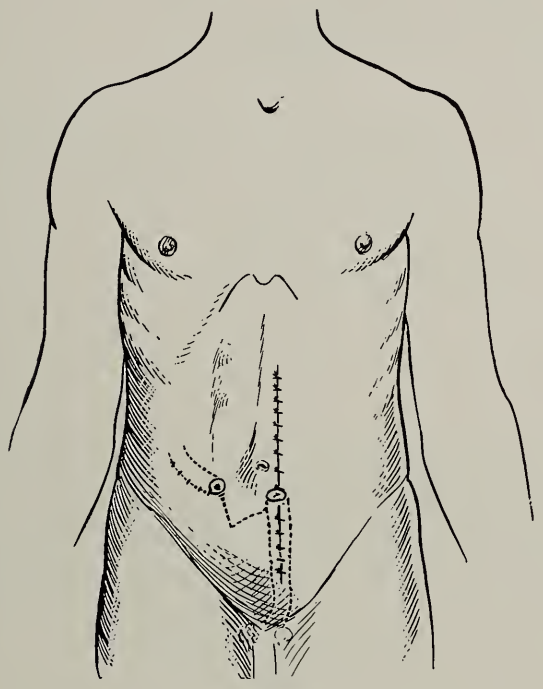


Fig. 5.

brought through the stab wound. The distal ileum is then folded back and the edge sutured to the edge of the skin with interrupted sutures. The proximal end of the defunctioned ileum is brought through the main wound (Fig. 5). The peritoneum and fascia are closed with figure 8 stainless steel wire sutures. The distal end of the defunctioned ileum is placed in the ano-rectal pouch.

Two days later the patient is again placed in either the lithotomy or the Sims position, and using local anesthesia, the perianal area and sphincters are anesthetized. A circular incision is made at the mucocutaneous junction of the anus. This incision is then undermined to expose the internal sphincter. After making certain that the ileum is under no tension, the serosa is sutured to the internal sphincter with fine sutures. The excess ileum is then transected leaving adequate length for suture to the perianal skin (Fig. 6).

About three months after the completion of the first stage the defunctioned segment is tested. A Foley catheter is used. The bag is inflated to occlude the proximal end of the defunctioned ileum. One hundred ml. of water is instilled into the ileum by way of the catheter. If this water is re-

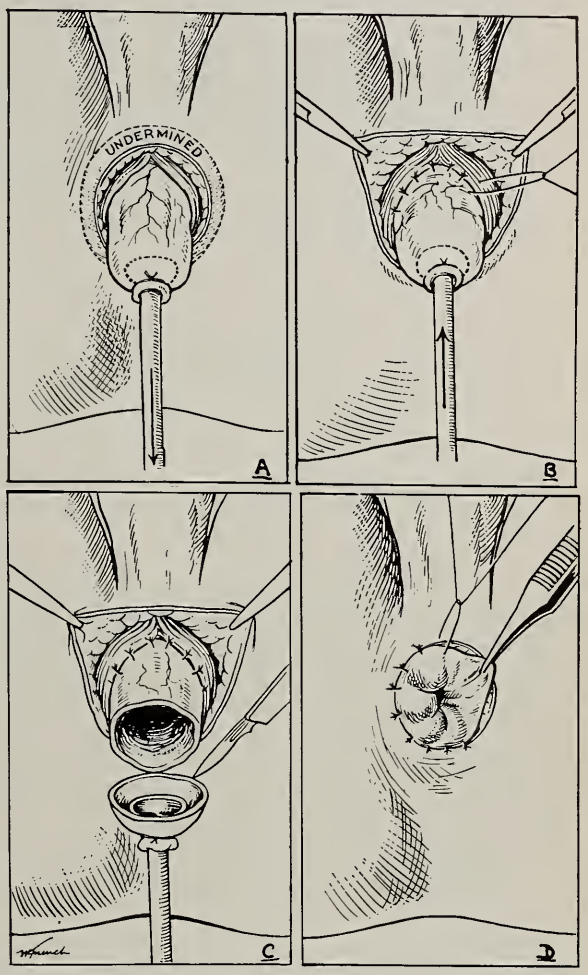


Fig. 6.

tained for four hours and then expelled, the patient has passed the continence test and is ready for ileo-ileostomy. The testing procedure should be repeated several times to insure adequate evaluation.

There are several excellent methods one can use to re-establish small intestinal continuity. We prefer the technique detailed in Figure 7. The left paramedian wound is reopened. The distal limb is mobilized. A transverse elliptical skin incision is made encircling the previously functioning ileostomy and the proximal limb mobilized. Fine silk or cotton is used throughout this procedure. First, a posterior row of interrupted seromuscular sutures is placed (Fig. 7A). This is followed by a row of posterior through-and-through interrupt-

ed sutures (B). The anterior opening is then closed by placing a row of inverting type of interrupted through-and-through sutures (C). Then an anterior row of sero-muscular interrupted sutures is used (D, E). After completion of the anastomosis the defect in the mesentery is closed. The right lower quadrant and left paramedian wounds are then closed.

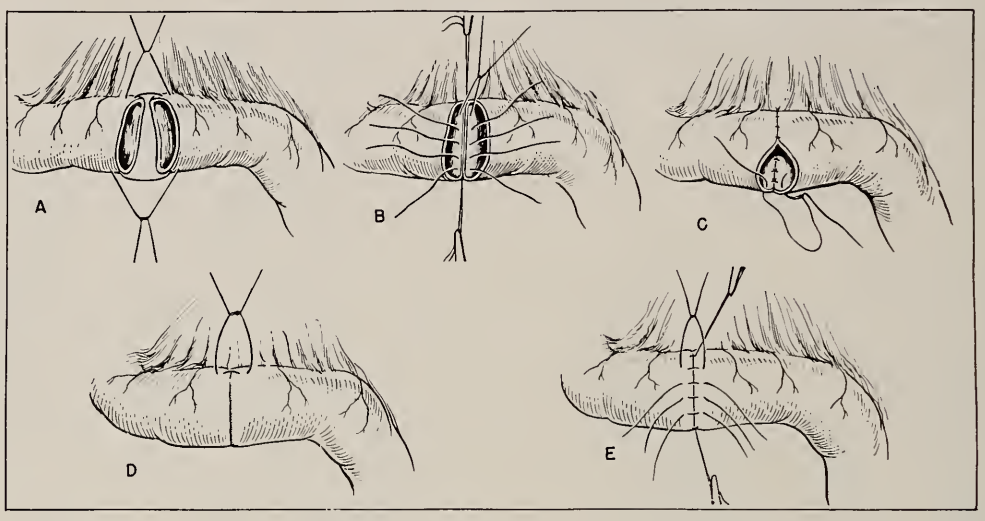


Fig. 7.

The shortest interval between the first stage and ileo-ileostomy has been two and one-half months, the longest two years.

Do's and Don'ts of the Procedure

1. Transect the ileum near the cecum to preserve maximum length of ileum and facilitate ileo-anal anastomosis *free of tension.*

2. Clamp the distal colon above the peritoneal reflection and irrigate the colon from below prior to curettage. This will minimize the possibility of presacral infection.

3. Drain the presacral space. Infection in this area may result in stricture and failure of the procedure.

4. Full thickness eversion of the temporary functioning abdominal ileostomy should be done. This prevents ileal dysfunction.

5. Don't attempt procedure if there is a short ileal mesentery. Some patients will not have a sufficient length of ileal mesentery to permit an anastomosis without tension; at present there is no way of lengthening this mesentery.

6. Don't attempt procedure in patients with previously destroyed sphincter mechanism. This is usually the result of excess scar formation in patients with fistulae-in-ano.

7. Do not attempt this procedure in patients with a recto-vaginal fistula. The induration and full thickness infection of the bowel in this condition diminishes chances of continence.

8. Do not attempt this procedure if there is gross disease of the terminal ileum. This indicates necessity for removing portion of ileum and possibility of further spread of disease.

9. Do not insert more than two and one-half inches of excess ileum into ano-rectal pouch in the first stage. The blood supply to all of ileum in the pouch may be compromised and the ileum may slough.

10. Do not attempt this procedure in elderly patients. Rehabilitation is difficult in this group.

Summary

A two-stage anal ileostomy procedure has been described which is useful for selected patients with ulcerative colitis or multiple polyposis with marked involvement of the distal large bowel.

The do's and don'ts of this procedure have also been presented.

References

1. Schneider, S.: Anal ileostomy: Experiences with a new three-stage procedure. A.M.A. Arch. Surg., 70:539, 1955.
2. Ravitch, M. M.: Anal ileostomy with sphincter preservation in patients requiring total colectomy for benign conditions. Surgery, 24:170, 1948.
3. Schneider, S.: Anal ileostomy. Description of a two-stage procedure. A.M.A. Arch. Surg., 75:854, 1957.

Amblyopia

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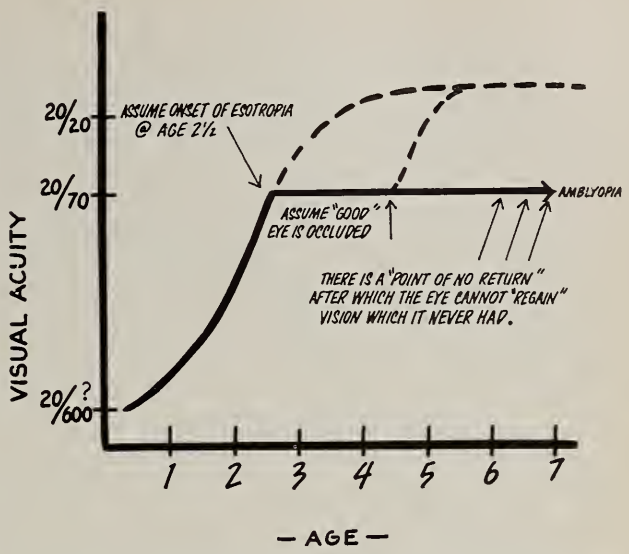


Fig. 2. Schematic demonstration of Amblyopia ex anopsia in a crossed eye.

A "lazy" or weak eye in a growing child must be detected and treated before age six to avoid permanent visual disability. It is difficult to impress some parents with this necessity and all physicians must be impressed with their sight-saving role.

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IT IS EASY to demonstrate to parents our concern over their cross-eyed child's deviating eye. It is much more difficult to impress upon them the need for preventing the development of a "lazy" or weak eye in the growing child. Of the two problems, treatment of amblyopia is far more important than treatment of a squint. Indeed, in the treatment of a squint our attention is directed first to establishing good vision in each eye.

Amblyopia has been described by Duke-Elder as a situation where one eye can't see well, and you can't see why. A patient with poor vision in one eye, without significant refractive error, without disruption of the passage of light through the ocular "media" (that is, cornea, aqueous, pupil, lens and vitreous), and without evidence of disturbance of the retina or optic pathways, has amblyopia. More precisely amblyopia is a selective cortical suppression of "macular pattern vision." The term "macular pattern vision" is used since often a patient unable to read any of the letters in a complete line (such as the 20/40 line) is able to read single letters of the same size.

Amblyopia is a common disorder. Dowing[1] found an incidence of 3.2 per cent in 60,000 Minnesota W. W. II selectees. A more recent study revealed a 5.27 per cent incidence among the general population.[2] Amblyopia can easily be detected, and can be positively diagnosed. Amblyopia is easily corrected, but only if treated early (before the age of six).

Detection

Suspect amblyopia whenever the two eyes show different levels of visual acuity. Establish the diagnosis by failure to improve the faulty eye's vision by appropriate glasses, and by ruling out intraocular pathology (such as cataract, macular disease, et cetera).

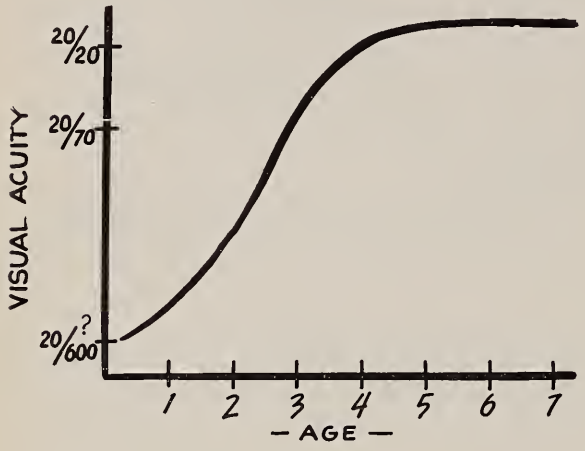


Fig. 1. Normal development of central visual acuity according to the theory of Amblyopia ex anopsia.

Well-child examinations (aged three) and pre-school examinations (aged four to five) should include tests for amblyopia. Physicians who examine these young patients should have a nurse or other aid well trained in the use of the kindergarten or illiterate E charts,* and aware of the tricks a child will employ to "peek" through a supposedly covered eye. If a pre-school child is unable to co-operate for E-chart testing, a repeat visit after practice at home is mandatory.

Special vigilance is in order for any child with a squint. As part of his routine examination, the family physician or pediatrician should include the following two tests:

1. Examination of the corneal light reflexes for evidence of asymmetric centering of the otoscope light in the two pupils.

2. The cover test, to examine for eye movement on covering one eye and then the other.

Either test, if abnormal, demonstrates the presence of squint. Further details on these tests are well outlined in a recent article by McNeill.[3]

Etiology

Amblyopia is most commonly seen in one of two conditions; namely, squint (especially convergent squint) and anisometropia (unequal refractive error). The following are several examples.

1. Boy, aged sixteen, SLPMC No. 35507. The best corrected vision was OD = 20/20; OS = 20/80. The diagnosis was left esotropia and left amblyopia. This patient has a left esotropia of moderate degree, present since early childhood. The amblyopia reduces the chance of a successful cosmetic result. Binocular vision is lacking even if the eyes are straightened and thus the new position is less likely to "hold."

2. Man, aged forty-four, SLPMC No. 35904. The best corrected vision was OD = 20/20; OS = 20/50. This man gave a history of being cross-eyed as a child, but his eyes are now perfectly straight. He is a good example of the cross-eyed child who "grows out of it," but at the expense of good vision in one eye.

3. Girl, aged fourteen, SLPMC No. 55893. The best corrected vision was OD = 20/20; OS = 20/400. The diagnosis was anisometropia and amblyopia. Cycloplegic refraction in this girl revealed the following correction: OD = +.75 = 20/20; OS: + 5.00 = 20/400.

4. Girl, aged eight, SLPMC No. 35587. Presenting vision OD = 20/40; OS = 20/100. This child had been examined on three previous occasions by an optometrist, without treatment. Cycloplegic refraction revealed OD: + 2.00 + 2.25 cx 85 = 20/20; and OS: + 2.25 + 3.75 cx 95 = 20/40. This case illustrates the need for adequate refraction, with cycloplegia if necessary.

Theories of Development

There are two theories as to the development of amblyopia. The first is represented by the term amblyopia ex anopsia (poor vision from not seeing). The second is better described by use of the term suppression amblyopia.

Amblyopia ex anopsia suggests that the poor vision is the result of failure to use the eye, and thus implies a passive process. This theory assumes we are born with poor central visual acuity (for example 20/600), and that use of the eye is required to develop sharp vision (which is therefore a conditioned reflex).

*E charts and instructions on testing young children are available without charge from the Minnesota Society for the Prevention of Blindness, Palace Building, Minneapolis 1, Minnesota.

Suppression amblyopia implies an active inhibitory reflex rather than a disruption in the learning process of vision. There is an actual cortical suppression of the image from one eye to avoid confusion, and a foveal (mid-macular) scotoma is actually produced (Fig. 3).

Each theory has its strong advocates and each serves a useful purpose in the practical understanding of amblyopia.

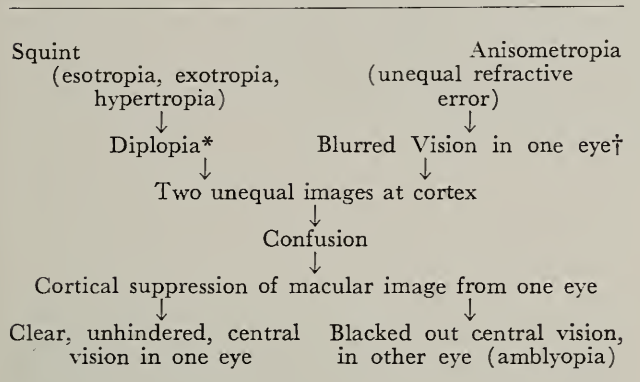


Fig. 3. Mechanism of production of amblyopia according to "suppression" theory.

*A startling illustration of the confusion produced by diplopia can be had by placing a 4 diopter prism base up before one eye.

†A similar illustration can be obtained by placing a +3.00 lens before one eye.

Treatment

The first step in treatment is correction of any significant refractive error. Then, total and constant occlusion of the non-amblyopic eye is necessary to:

1. Allow further development of central visual acuity in its previously interrupted learning process, or

2. Allow the central scotoma to recede, and fixation to return to the fovea where maximum visual acuity exists.

Take your choice of these two theories—the treatment is the same.

Partial (part of the day or week) occlusion is of questionable value in my experience. I often recommend that patients leave the patch on all night to avoid that half-hour lapse in the morning before the cover is re-applied. Examination for improvement in vision should be made about every three weeks, and occlusion should be continued up to three months or longer.

TABLE I. RELATION OF IMPROVEMENT IN AMBLYOPIA TO AGE AT ONSET OF TREATMENT

Number	Pathology	Age First Occluded (yrs.-mos.)	Initial Corrected Vision	Final Corrected Vision
1	ET	3-7	20/80	20/20
2	ET	3-9	20/200	20/20
3	ET	3-9	20/200	20/25
4	XT	4-3	20/40	20/20
5	ET	4-10	20/400	20/20
6	ET	4-11	20/400	20/20
7	ET	5-4	20/70	20/20
8	R ≠ L	5-9	20/30	20/20
9	ET	6-0	20/60	20/20
10	ET	6-3	20/50	20/20
11	R ≠ L	6-5	20/30	20/30
12	R ≠ L	6-7	20/50	20/40
13	ET	6-8	20/40	20/20
14	ET	6-9	20/50	20/25
15	ET	6-9	20/300	20/40
16	ET	6-11	20/30	20/20
17	ET	7-5	20/30	20/30
18	ET	7-10	20/200	20/50
19	R ≠ L	9-3	20/60	20/25

ET=Esotropia (Convergent squint)
XT=Exotropia (Divergent squint)
R ≠ L = Anisometropia (Unequal refractive error)

Results of Treatment

In youngsters under the age of six years, improvement to 20/20 vision can be expected in almost every case. However, in patients over age six and one-half years, results are generally more disappointing. In Table I, patients are arranged in order of age at onset of occlusion, and improvement in visual acuity is recorded in the right hand column. Occlusion was continued in each case, until no further improvement occurred after an additional three weeks of treatment. The final vision in the first ten patients ranging from three years, seven months to six years, was 20/20 in all but one. In the remaining nine patients, occlusion was started after age six years and the final corrected vision usually fell short of 20/20 acuity. This experience is well known to all ophthalmologists, nevertheless the evidence presents a strong argument for adequate screening for amblyopia in pre-school children.

Conclusions

1. Amblyopia is a threat to useful vision.
2. The need for detection and treatment prior to age six years is demonstrated.

References

1. Downing, A. H.: Ocular defects in 60,000 selectees. Arch. Ophth., 33:137, 1945.
2. Cole, R. B. W.: The problem of unilateral amblyopia. Brit. M. J., 5116:202, 1959.
3. McNeil, J.: The detection of strabismus in a preschool examination. Minn. Med., 42:1054, 1959.

Unexpected Sudden Natural Deaths

Unexpected sudden natural death is fortunately infrequent. Every physician needs to be familiar with its more common, although obscure mechanisms. Only by being armed with knowledge of its causes, together with pharmacological and mechanical skills for resuscitation, can the physician rescue more patients.

"Since every man who lives is born to die,
And none can boast sincere felicity,
With equal mind, what happens let us bear,
Nor joy nor grieve too much for things beyond our care,
Like pilgrims, to th' appointed place we tend;
The world's an inn, and death the journey's end."[1]

"Sudden death may be said to be a relatively rapid transition within minutes to a few hours from a state of comparative good health to the deceased state."[2]

"Unexpectedness outweighs suddenness, and this unexpectedness arouses a suspicion of violence. Unexpectedness means that this death may not have been foreseen a few hours previously and that deceased probably had a pre-existent organic disease of which neither he nor his relatives were aware."[3]

"15 to 20 per cent of all deaths are unexpected."[4]

"In a locality where sudden deaths are habitually reported due to disease, (without autopsy), a significant number are homicides, suicides or accidental deaths."[5]

"In those states having adequate laws, 20 per cent of all deaths need some investigation."[6]

"Death occurred so suddenly and unexpectedly that there was little or no opportunity to make an antemortem diagnosis. Often, and frequently erroneously, death is called sudden if the person is found unexpectedly dead as the result of natural causes, but the duration of symptoms is unknown."[7]

"The coroner's chief duty is to exclude death by violence or foul play and to recognize those due to natural causes, which, incidentally, constitute two-thirds of all unexpected deaths."[8]

"The coroner must exclude violence or foul play as a cause of death, they being found in one-third of the cases he investigates."[8]

IN THIS PRESENTATION, I shall omit reference to deaths from violence, homicide, suicide, automobile casualties and other accidents, and sudden deaths in early infancy (Table I).

Natural deaths must be differentiated from deaths by violence. "Many apparently dead from natural causes, even in the absence of external evidence of injury—actually were killed by violent means."[9]

Why should this subject be presented? It appears to me that there is a definitive need for acquiring and disseminating information regarding this matter because:

1. Comparatively little has been written and printed on this topic.

2. This type of death is infrequently witnessed.

3. By further study and research, valuable information may be obtained which could serve to prevent episodes of syncope and the like which

TABLE I. CORONER'S RECORD OF CRIB DEATHS IN RAMSEY COUNTY, MINNESOTA
(12 months and under) 1938-1957

Year	'57	'56	'55	'54	'53	'52	'51	'50	'49	'48	'47	'46	'45	'44	'43	'42	'41	'40	'39	'38
Number	39	34	18	28	20	21	21	12	22	19	26	16	32	28	33	38	40	41	35	34
Male	30	20	12	21	14	12	15	8	14	11	20	6	21	15	20	26	26	21	20	22
Female	9	14	6	7	6	9	6	4	8	8	6	10	11	13	13	12	14	20	15	12
Autopsies	22	16	3	7	5	5	3	3	3	2	7	5	7	6	6	2	2	2	3	5
Not posted	17	18	15	21	15	16	18	9	19	17	19	11	25	22	27	36	38	39	33	29
Respiratory	19	21	10	17	8	4	5	3	5	6	4	3	1	7	11	4	4	4	3	7
Suffocation	2	4	2	4	5	5	3	0	4	3	4	2	5	1	4	4	4	3	5	4
Not posted	1	2	0	2	0	1	0	0	0	0	0	0	4	0	2	3	4	2	4	2
Accidental	7	10	3	6	7	5	5	3	8	4	10	8	8	6	7	6	8	6	7	6
Homicide	0	2	0	0	0	0	0	2	0	1	0	0	0	0	0	1	2	0	2	1
Natural	32	24	15	22	13	16	16	9	14	15	16	8	24	22	26	32	32	35	28	28

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may lead to death and which also could disseminate facts and knowledge regarding resuscitative measures.

4. It is of fundamental importance medicolegally to establish the diagnosis of the cause of death—in order to detect crime and conversely to protect the innocent.

What is our philsophy of death? Death comes at the end of a long or short illness. It is said that there is no difference between death from accident and death from illness. "Instant death occurs only in cases of nerve lesions, but sudden death may be due to many causes."[10]

"Senescence is not an explanation of death—the cause being arterial degeneration, the ultimate cause is not known and there is no known preventative of such a lethal disease, namely arteriosclerosis."[10] Julius Caesar, being asked as to the most desirable manner of dying replied, "That form which is not anticipated."

Someone asked Axel Munthe what he regarded as life's greatest boon and he replied, "Sudden death with no doctors around."[11] There are a few articles in literature on the subject of dying, including Osler's essay which is well worth reading.[12]

Society demands that every sudden, unexpected and obscure death be fully investigated to determine its cause, for obvious reasons.

On investigation of the literature of the past ten years, it will be observed that various writers have different ways of classifying the common causes of unexpected death in the order of their importance.

In summarizing the deaths in young soldiers, there are five categories:[13]

1. Heart disease
2. Intracranial hemorrhage
3. Meningococcemia
4. Miscellaneous causes such as respiratory tract infections.
5. Obscure causes with negative necroscopic findings comprising 10 per cent of all sudden nontraumatic deaths of apparently healthy young men.

Another listing:[15]

1. Most common natural cause of death is coronary artery disease.
2. Next most common: Rupture of a blood vessel with fatal hemorrhage.
3. Death due to overwhelming infectious disease, producing no recognizable symptoms until the final espisode.[14] Massive obstructive edema of larynx incident to what was thought to be a minor infection.

One view[16] of the common causes of sudden death is:

1. Coronary disease or myocardial infarction.
2. Ruptured aortic aneurysm.
3. Cerebrovascular incidents or episodes.
4. Massive pulmonary embolism.
5. Exsanguinating gastro-intestinal hemorrhage.

Another author[17] epitomizes:

1. Deaths whose pathogenesis may or may not be explained by necropsy.
2. Sudden unexpected deaths with clinical explanation and necroscopic confirmation. Examples: Subarachnoid hemorrhage, previously known aneurysm, pulmonary embolis, prior existing fibrillating heart.
3. Unexpected deaths unexplained by necroscopy; e.g., the unexpected demise of emotional shock, great fright. inhibition, parasympathetic death.

TABLE II. CORONER'S RECORD OF DEATHS IN RAMSEY COUNTY, MINNESOTA 1949-1958

Year	1958	1957	1956	1955	1954	1953	1952	1951	1950	1949	10 Year Period	Average
Automobile	47	51	50	47	58	46	49	53	51	57	509	50.9
Drowning	10	12	6	15	13	10	12	10	13	9	110	11.0
Railroad	3	0	1	2	1	0	8	2	4	1	22	2.2
Burns	18	10	12	8	6	16	6	15	16	10	117	11.7
Miscellaneous	55	61	62	98	45	123	99	122	154	97	926	92.6
Total accidentals	133	134	131	170	123	195	174	202	238	174	1674	167.4
Homicides	8	5	8	4	1	7	4	8	9	6	60	6.0
Suicides	27	26	30	36	36	39	26	19	28	34	301	30.1
Naturals	470	535	453	385	414	335	349	347	347	451	4086	408.6
Grand total	638	700	622	595	640	576	553	576	585	625	6110	611.0
Deaths, county	3867	3908	3760	3574	3600	3653	3552	3634	3551	3707	36806	3680.6
Per cent of deaths (coronary)	16%	18%	17%	16%	18%	16%	16%	16%	16%	17%		16.5%
Autopsies performed	182	160	159	116	74	64	60	65	62	89		103.1
Per cent autopsies (coroner)	29%	23%	26%	19%	18%	11%	11%	11%	11%	14%		17%

"Instantaneous death is usually cardiac and there is a close similarity between instant death and syncope; and instant death is fatal syncope."[18]

Stress, strain and disease develop a condition of hyperactivity of reflexes which explains why the effect of emotions or chemical stimuli on the heart and vessels is slight, and surgical manipulations of certain central nerve structures may be done with safety—but in a few cases, such stimulating procedures precipitate alarming seizures and death.

Ischemic myocardium with hyperactive vagal reflexes may kill instantly during strain of defacation. Incidentally, the statement that "Ventricular fibrillation is the underlying physiological state in the causation of instant death" is disputed. "Hyper-irritable myocardium of anoxia, possibly of infectious origin and hyperactive reflexes, singly or in combination, play an important role."[18]

Not too uncommon is a situation where:

1. History and investigation yields very little information.

2. Necroscopic findings are negative.

3. Microscopical, biological, chemical, toxicological tests are negative.

4. If then we eliminate concealed injury, e.g. fracture dislocation of the neck, we must conclude that death is functional.

Allergy is mentioned as a not too infrequent cause of sudden unexpected unanticipated death, but much work remains to be done on this topic.

Anesthetic deaths are dramatic, tragic, unexpected and, rare. Most anesthetic casualties occur where there is a very serious primary disease and seldom is death due primarily to the anesthetic substance itself or to presurgical procedures, including anesthetic drugs. Occasionally, it is due to bad administration or a bad combination of various anesthetic agents or to hypersensitivity to cocaine or its derivatives.

Three types of dying are listed:[19]

1. Death within seconds—all manifestations of life except warmth disappear, there being no sequence of events.

2. The last scene in minutes. The heart stops either in ventricular standstill or ventricular fibrillation. (This kind of death is common but as it comes unexpectedly, it is not clearly understood.)

3. Miscellaneous deaths which do not occur so much suddenly as unexpectedly. For example: cerebral hemorrhage, thrombosis, pulmonary emboli, shock, etc. Which patient is liable to what type of death? What are the prodromes? If more were known, prophylactic measures, cardiac resuscitation and other procedures could be instituted at the proper time perhaps.

In Ramsey County during a ten-year period from 1949 to 1959, there was a total of 36,806 deaths, or an average of 3,680 per year. Of these totals, the Coroner's Office handled 6,110, or an average of 611 deaths annually (16.5 per cent).

In 1949, there were eighty-nine necroscopies performed (14 per cent), and in 1959 there were 182 necroscopies performed (29 per cent). Each year there was a figure of 203 deaths from violence (33.3 per cent) and 408 natural deaths (66.6 per cent). (Table II)

Case Citations

Case 1.—Man, aged sixty-five. Hemorrhage from the esophageal varices.

Necroscopic Report.—Esophagus showed varices along lower half. There was erosion at the esophageal-gastric junction and this opened into one of the varices. Stomach was dilated with estimated 1500 cc. of blood. Small bowel and colon contained old blood.

Cause of Death.—(1) Ruptured esophageal varices; (2) cirrhosis; (3) pulmonary edema; (4) diabetes mellitus.

Case 2.—Male infant, aged 3, died at home. The child was apparently perfectly well. The father was unable to waken the boy and called the police. The coroner at scene ruled death natural.

Necroscopic Report.—There was 50 cc. straw-colored fluid in the pleural cavities. Lung surfaces were smooth with small dark hemorrhagic areas. Cut section indicated thin watery fluid, blood-tinged.

Cause of Death.—Bilateral bronchopneumonia.

Case 3.—Man, aged fifty-nine. Necroscopy was performed. While driving his car, he was seen to weave in his lane and then drive off and hit a tree. He died instantly.

Necroscopic Report.—Abdominal cavity showed large hematoma arising from around celiac axis, two fractured ribs which do not enter the pleural cavities. Lungs were normal with no evidence of congestion. The heart was moderately enlarged. Valves and myocardium were normal. Arch aorta was markedly sclerotic. Coronary vessels also were markedly sclerotic. Abdominal aorta was markedly sclerotic with large irregular rough patches of calcium. In the region of the right renal artery, one of these was torn loose with a small rupture through the aorta from which blood came.

Cause of Death.—Rupture of the abdominal aorta due to arteriosclerosis.

Case 4.—Man, aged eighty-two. Necroscopy was performed. He was brought to the hospital in a private car. He had not seen a doctor for four months.

Necroscopic Report.—The abdomen, with subcutaneous fat, was smooth. The peritoneal cavity contained 600 cc. bloody sero-sanguinous fluid. There was massive retroperitoneal hemorrhage from the region of the left kidney across the midline, pushing forward the ascending colon and cecum, extending up to the diaphragmatic surface and inferiorly into the pelvis. Thorax: right lung showed few adhesions. The right pleural cavity contained about 50 cc. yellowish fluid. The left lung showed many dense adhesions over the diaphragm and lateral surfaces of the lower lobe. Heart valves were normal. Coronaries showed a moderate degree of atheromatous plaqueing. The myocardium was normal. The liver showed a nutmeat appearance. Examination of the gall bladder, spleen, pancreas, adrenals, kidneys, bladder and prostate resulted in negative findings. The gastrointestinal tract showed nothing of note. The abdominal aorta showed the presence of an extremely large aneurysm, measuring 17.0 cm. in length from the bifurcation of the aorta proximally. At the superior aspect of the aneurysm, a large rent about 6.0 cm. long was seen.

Cause of Death.—Ruptured aneurysm in the abdominal aorta.

Case 5.—Man, aged forty. Wife found husband "cold" in bed and called police. Necroscopy was performed. The man had had a surgical gastric resection three years previously and was receiving a pension for gastric ulcers from U.S.V.A.

Necroscopic Report.—External examination gave negative findings. The skull when opened showed no abnormalities. Examination of the brain revealed no evidence of injury or hemorrhage. The pleura were normal. The left lung was normal. The right lung showed marked congestion in the lower and mid lobes. No gross evidence of pulmonary embolus was found. The perica dium contained about 1 ounce of clear fluid. The heart was normal. There was a slight amount of atherosclerosis at the base of the aorta. Coronaries were patent. The upper abdominal cavity was obliterated by adhesions. The upper two thirds of the intestines was dark with what appeared to be blood. The stomach was opened, showing the gastric mucosa was hypertrophied and hemorrhagic. Contents were about a cup of bloody fluid with no clots. The mucosa of jejunum was attached to the stomach, which was also hemorrhagic. No gross ulcerations were seen. The liver, gall bladder, and pancreas showed no abnormalities. Kidneys and pelvic organs were normal.

Cause of Death.—(1) Pulmonary congestion right lower lung, undetermined cause, (2) hemorrhagic gastritis.

Case 6.—Girl, aged fourteen. Following spontaneous subarachnoid hemorrhage at her home, natural death ensued. Necroscopy performed. The child had complained of severe headaches the previous week, but was perfectly well otherwise. She had no medical examination or care.

Necroscopic Report.—On opening the skull, there was a diffuse subarachnoid hemorrhage covering most of the surface of the brain but mostly in the right temporal region. A large clot was found at the base of the brain in the region of the medi-cerebral artery. No definite aneurysm was found. Vessels were frail and tore easily. There were no other abnormalities.

Cause of Death.—Subarachnoid hemorrhage (Dr. Sterner, pathologist).

Case 7.—Man, aged forty-seven. Subarachnoid hemorrhage. Necropsy was performed. The man was found alone lying on the floor of his home. Final episode—he fell on the floor. He was a tuberculous patient at Ancker Hospital from January 11, 1957 to April 18, 1958.

Necroscopic Report.—There was cyanosis over the entire body, when death took place a considerable time before being discovered. There was no evidence of injury. The skull was opened, but there was no sign of fracture. The entire surface of the brain was covered with hemorrhage. The circle of Willis was dissected out. The right chest pleural cavity was obliterated by adhesions; the left chest partially so. Coronaries showed

moderate atherosclerosis, especially in the anterior descending branch.

Cause of Death—Subarachnoid hemorrhage.

Case 8.—Woman, aged fifty-five. Necroscopy was performed. The woman, who had suffered a compound ankle fracture, was admitted to the hospital and died eight days later. While in the hospital, examination showed rales in the bases of both lungs, and chest radiograph showed haziness at the base of the left lung. There was a question of cardiac decompensation or pneumonitis. The terminal episode began with dyspneia, perspiring, and weak pulse. Blood pressure dropped from 140/72 to 102/60. The patient was given oxygen. There was cyanosis of the fingertips and epigastric distress.

Necroscopic Report.—The heart was normal. There was adrenal, moderate cortical atrophy. A fresh embolus in one artery measured 5 mm. in diameter. In another artery, there was a large 15 mm. fresh embolus.

Cause of Death.—Massive pulmonary embolism.

Case 9.—Man, aged thirty-nine. While sitting in a dentist chair, with dentist working on his teeth, this man suddenly died. He was previously well, and when questioned by the dentist as to his good health, all answers were normal. Blood pressure was normal. The dental assistant gave the anesthetic of nitrous oxide and oxygen, and three teeth were removed in one minute. The dentist observed a slight cyanosis, but no trouble in breathing. He ordered the anesthetist to increase the oxygen until the patient was receiving pure oxygen.

Necroscopic Report.—Cause of death was cardiac arrest and edemic congestion of the lungs.

Case 10.—A man, aged forty-nine, had been previously treated for cancer of the larynx. After being ill at home for a few hours, he was taken to Ancker Hospital, where he suddenly died.

Necroscopic Report.—Laryngectomy, old; brain atrophy, slight; pyelitis, slight.

Cause of Death.—Severe coronary sclerosis.

Summary

The literature for the past ten years has been reviewed and the categories of death as classified by different authors have been given. Unfortunately, not enough is presently known as to the details of the different methods and manners of dying. Further study and research along these lines has been suggested with a view toward increasing knowledge by more efficient and comprehensive post-mortem examinations. It has been suggested that this might even be life-saving.

A physician should become more familiar with the subject of dying and be especially concerned with sudden unexpected and obscure types of death. He should know the various procedures of resuscitation, the techniques of the proper use of drugs, methods of opening the chest and of cardiac massage and other relevant data and procedures.

Knowing these well, it would be logical to assume that he then may be able, if only on rare occasions, to restore life to one apparently dead.

References

1. Dryden: *Palamon and Arcite.* Book III, l.2, p. 159.
2. Mathews and Le Doux: *J. Louisiana M. S.,* 108:10-20 (Jan.) 1956.
3. Babson, S. M.: *Arch. Int. Med.,* 86:361-375 (Sept.) 1950.
4. Bauer, J.: *J. Michigan M. S.,* 57:729-733 (May) 1958.
5. Moritz, A. R.: *G. P.,* 10:35-42 (Dec.) 1954.
6. Ford, R.: *Ann. West. Med. & Surg.,* 4:466-467 (Sept.) 1950.
7. Moritz and Zencheck: *Arch. Pathol.,* "Sudden and Unexpected Death," Nov. 1946, pp. 459-494.
8. Gradwohl, R. B. H.: *Legal Medicine,* 1954, p. 157.
9. Long, R. H.: *Postgrad. Med.,* 24:A-38 (Sept.) 1958.
10. Wadsworth, Wm.: *Post Mortem Exams,* 1916.
11. Munthe, Axel: *The Story of San Michele.* New York: E. P. Dutton Co., 1934.
12. Osler, Sir Wm.: *Aequanimitas and Other Addresses.* 2nd ed. Philadelphia: P. Blakiston's Sons, 1906.
13. Moritz and Zencheck: Sudden and unexpected death. *Arch. Pathol.,* pp. 459-494 (Nov.) 1946.
14. Long, R. H.: *Post Graduate Medicine,* 24:A-38 (Sept.) 1958.
15. Moritz, A. R.: *G. P.,* 10:35-42 (Dec.) 1954.
16. Mathews and Le Doux: *J. Louisiana M. S.,* 108: 10-20 (Jan.) 1956.
17. Bauer, J.: *Postgraduate Medicine,* 22:A-34 (Oct.) 1957.
18. Weis, Soma: *New England J. of Med.,* 223:793-797, 1940.
19. Bean, W. B.: *J. Iowa M. S.,* 42:52-54 (Feb.) 1952.

Bibliography Not Cited

Alvarez, W. C.: Care of the dying. *J. A. M. A.,* 150: 86-93, 1952.

Osler, Sir Wm.: Science and Immortality. London: Archibold Constable & Co., 1906.

Ogilvie, Heneage: Journey's end. *Practitioner,* 179:584 (Nov.) 1957.

Ryle, John A.: On death and dying. Journal-Lancet, 2:400-402, 1940.

Gonzales, T. A.; Vance, Morgan and Helpern, Milton: Legal Medicine and Toxicology. 1st ed., pp. 66-87. New York: D. Appleton-Century Co., 1937.

Young, Warren R.: Your Doctor and You—Rx for Modern Medicine. *Life* Magazine, p. 156 (Oct. 12) 1959.

Firmingham, Harlan J.: Proceedings of Annual Seminar, Kansas City. Page 32, 1955.

The Dilemma of Dislocations of the Hip Following Dashboard Injuries

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WITH THE advent of high speeds and an increase in auto accidents, dashboard injuries, dislocations of the hip and the dilemma of treatment has confronted the physician who treats injuries.

Of 661 automobile injuries reviewed in a series by Kulowski, fifty-five (10 per cent) involved the pelvic region. Almost twenty involved the hip joint proper with the predominant injury a fracture-dislocation. There were five fractures of the acetabular region without dislocation and three pure dislocations without fractures.[4]

Pathomechanics

Two main mechanisms of injury exist, usually dependent on whether the passenger remains with the car or is ejected.

When an occupant is thrown from the car, an impact against the outer aspect of the thigh may result in direct stress to the lateral thigh aspect with the stress subsequently transmitted through the head and neck region and finally to the acetabulum. This mechanism of injury will be discussed more completely under the subheading Central Dislocations of the Hip.

Following the knee-dashboard impact that results when the patient remains with the car, several bony areas successively receive the brunt of the stress. The pattern of force is transmitted from the patella to the femoral condyles, to the supracondylar region, to the intertrochanteric region and finally to the hip joint.

The sex of the passenger may determine the final disability. The usual position of the male in the front seat of an auto is one of wide abduction, whether he is the driver or a sleeping passenger. In this position, the femoral head is well seated in the acetabulum with the greater trochanter almost abutting on the posterior and inferior aspects of the ilium. With the continuing force of the stress in this abducted position, there is a central thrust and a large fragment of acetabulum is fractured. The usual position of the female is with the hips adducted or the legs crossed. The femoral head thus is well out of the acetabulum and posterior dislocation of the hip results from the impact. A smaller acetabular fragment may be created but large fragments and femoral shaft fractures are not as common as in the male.[6]

Anterior dislocations result from exaggerated abduction and external rotation. This mechanism is uncommon. The thrust is created from the momentum of the body as it continues forward while the knee becomes fixed against the dashboard or the legs braced against the floor. If there is any

backward inclination to the trunk, as is seen in a hyperextension position of the spine, then a large postero-superior wedge of the acetabulum may be sheared off.

Pathological Anatomy

The femoral head can be dislocated only if there has been extensive fraying of the ligamentum teres or if a complete tear has resulted. Anteriorly the ilio-femoral ligaments form a buttress to prevent dislocation, but posteriorly there are no significant ligamentous structures, and the acetabulum is shallower.

When the hip is dislocated posteriorly, the short rotators, gemelli and quadratus femoris are usually torn. In anterior dislocations, extensive tears of the rectus and adductor groups may result.

In respect to the periarticular structures when a large segment of the bone is detached from the rim, the capsule is essentially intact except for possibly a single tear in its posterior portion. The head does not protrude through the capsular and periarticular structures but presents between the fracture fragments.[9]

Osseous Structures

In respect to acetabular fractures, the subsequent classification as suggested by Bohler[1] is made to identify the extent of trauma:

Group I. Dislocations of the hip without fractures.

Group II. Dislocations of the hip with minor avulsions of the bone, secondary to ligamentous tears. These avulsions are usually seen at the superior or inferior lips. The reduction is stable if the fragment is not large enough to become interposed during the mechanism of reduction.

Group III. Dislocation plus posterior lip fragments which follow when slight abduction to the thigh had been present during the mechanism of injury. A stable joint is usually formed following reduction. Avascular necrosis is not common in the preceding three groups.

Group IV. Dislocation plus a large wedge created from the posterior-superior portion of the acetabular roof. Here the joint is usually unstable following reduction and there follows a relatively high percentage of avascular necrosis of the femoral head.

Group V. Dislocation with considerable disruption of the acetabular floor. The fragments are usually displaced medially and an unstable joint created.

Two degrees of obvious trauma may occur to the femoral head. Cartilaginous flakes and small fragments of bone from the femoral head may be formed by the initial injury or from the mechanism of reduction. Both foreign bodies may become manifest after several years as impinging elements during the range of motion and possibly perpetuate arthritic changes in the joint.

The subchondral area of the femoral head may become contused and crushed following impingement against the acetabalum. On x-ray these changes may not be readily seen because the over-all contour has been restored. The presence of a large acetabular fragment should arouse the suspicion of a serious contusion of the subchondral bone of the femoral head.

Marginal fractures may be detached but are usually insignificant in respect to over-all articular surface. The proximal femoral epiphysis may be displaced and simultaneously reduced when the dislocated hip is reduced. If an adequate reduction has not been obtained, surgical replacement is necessary. Fractures of the femoral neck and shaft may also occur with the dislocation.

Nerves

Following posterior dislocations the sciatic nerve may become interposed between the femoral head and acetabulum and block reduction. Prolonged pressure from displaced acetabular fragments may result in significant injury to the nerve. The femoral nerve is subject to pressure in anterior dislocations but this is a rare feature.

Arteries

The femoral artery is a potential source of disaster in anterior dislocations. No significant major vessels are compressed with posterior dislocations.

Clinical Examinations

The general appraisal of the individual following an accident must precede local evaluation. The presence of shock must be recognized and treated. Relatively normal blood pressure, pulse, and respiration may offer a false sense of security to the doctor. If these signs are taken at face value, the pale sweaty individual who is experiencing extreme pain may continue in shock.

Once the individual's general appraisal has been made local evaluation of pelvis and hips can be completed. A posterior dislocation of the hip is suggested by adduction, flexion and internal rotation of the lower extremity. An anterior dislocation is suggested by abduction to 60 or 70 degrees and the knee extended.

The color and temperature of the limb, the integrity of the dorsalis pedal and posterior tibial arteries, the patellar and Achilles reflexes can all be quickly determined and offer the necessary information in respect to distal neurovascular supply. Anti-shock measures should be instituted immediately, open wounds covered, and once the patient's condition stabilized, specific x-ray studies can be obtained.

Pain and shock may be intensified if the patient is moved before adequate, even though crude, splints are applied. The increased hazard of fat embolization following inadequate splinting is real.

X-rays are important in evaluating concomitant fractures or injuries, especially to the neck or trochanteric region of the femur. Specific attention must be paid to the over-all configuration of bone. In posterior dislocations, the lesser trochanter is rotated sufficiently so that it may not be visualized. In anterior dislocations, the lesser trochanter may be seen in profile while the greater trochanter lies behind the femoral head. If pelvic ring damage has been associated, the combined procedure of catheterization and cystogram may be accomplished to offer an early appraisal of urethral and bladder trauma.

Therapy

Following stabilization of the patient's condition and exclusion of other major significant injuries, the dislocation must now be treated. Depending on concomitant injuries and possibly the relationship of recent food ingestion to the time of injury, the choice of anesthesia may vary. Stuart and Milford stress the urgency of reduction because in their evaluation of forty patients following closed manipulation, none, in whom reduction was delayed beyond twenty-four hours, showed a good result. It is possible to accomplish a reduction with local infiltration of 2 per cent xylocaine but frequently enough spasm has occurred that the relaxation offered with spinal or general anesthesia is necessary.

Text books[3] frequently offer circumduction maneuver to reduce the dislocations, but the following maneuver is applicable to both anterior and posterior dislocations. The patient is placed in a supine position with the hip and knee flexed. The hamstrings become relaxed, a posterior dislocation placed at the level of the acetabulum from its superior position and an anterior dislocation converted to a posterior dislocation. With the pelvis then steadied by an assistant or a binder, longitudinal traction is applied to the lower extremity. It should not be necessary to rotate the femur, and circumduction may actually result in an acetabular lip fracture or further tear in the sciatic nerve.

Once reduction has been obtained, the rehabilitation program can be started. It is difficult to find a group of traumatic surgeons or orthopedists who will agree to a uniform plan. The following may be used as a working baseline. Balanced suspension traction of 5 to 10 pounds, for a four- to six-week period will allow soft tissues to heal adequately. In most cases, this weight is sufficient to overcome post-traumatic muscle spasm and pain. When pure dislocation exists without associated fracture of either the lip or the head, mobilization can then be started and a weight bearing regimen planned. Femoral head collapse and avascular necrosis do not occur as frequently in pure dislocations as when associated with gross fractures. Unsupported weight bearing in the extremity should be deferred for approximately four to six months, and an ischial seat long leg brace may be utilized for support during this period.

Dislocations of the Hip and Acetabular Fractures

If a circumduction maneuver is used in the reduction, it is possible for fragments of the posterior lip of the acetabulum to become interposed. These fragments remain attached to periosteum at the level of the hip and do not displace with the femoral head. Reduction can be accomplished in most cases as a pure dislocation, and if interposition results, surgery is indicated to remove the fragment and replace it if significant to alter joint stability. Usually one or two screws will suffice to maintain stable fixation following replacement of large fragments.

If dislocations occur with marginal head fragments, these usually remain extra-articular following reduction, and no immediate surgery is necessary. This type of trauma is usually indicative of moderate injury to the femoral head and reconstructive procedures may be necessary in the future.

The after-care of patients sustaining dislocations

and large acetabular fragments must be more cautiously proposed. When the femoral head has received such trauma, reconstruction becomes a problem and protection much more definite. If a large fragment has been reduced but not fixed, a plaster spica for six to eight weeks is sufficient. This is followed by mobilization. If the large fragment has been fixed, then the limb may be continued in traction, and an ischial seat long leg brace may be given for ambulation without stress of weight bearing.

The use of an ischial seat long leg brace is to be considered whenever the mechanism of injury may have caused strain on the femoral head. A period of six to nine months may be chosen as the arbitrary period of protection and during which the greatest percentage femoral head necroses first appear. It should be stressed that the protection of weight bearing by a brace may serve only as possible prophylaxis to further disintegration of the head. The use of the brace is not advocated to prevent or modify the course of an asceptic necrosis occurring in the femoral head.

Central Dislocations of the Hip

Two groups occur differing in mechanism, pathology and clinical course; when the femoral head is dislocated toward the center of the pelvis in relation to the intact acetabular roof, and when the head is displaced superiorly and medially with a large acetabular fragment.

In the first group, the mechanics of injury is usually secondary to a force directed medially from the greater trochanter. This mechanism may follow a passenger's fall onto his hip after being hurled from a vehicle.

The femoral head becomes compressed by the force when it is driven against the anterior part of the acetabulum, and although radiographic alterations may not be present, this force should be appreciated.

In the second group, the mechanism may result from a fall to the ground when the iliac crest is struck before the trochanter. The strong anterior ilium and anterior acetabular roof fracture forward leaving the femoral head in a displaced position with a medial and superior portion of the acetabular roof. The displacement is not secondary to thrust on the femoral head, and pressure necrosis is not as common.

The treatment of central fractures of the acetabulum become difficult to assess. Recently several authors have advocated the use of open reduction and internal fixation to align and retain position of the fragments. If a serious, and usually prolonged procedure is contra-indicated by the patient's condition, continuous traction through the supracondylar region or tibial tubercle may be effective in obtaining and maintaining satisfactory position and early functional results.

The after-care of the patient following healing of the fracture fragments, which usually takes between six and eight weeks, is similar to that followed in the rehabilitation program in pure dislocations.

Conclusion

A dislocation or fracture-dislocation of the hip occurs in moderate frequency following knee-dashboard impacts. By attempting to categorize the extent of injury, some element of prognosis can be made and a plan formulated for therapy. Prophylactic care appears to be one of the few aspects available to the physician in preventing the complications of the injury. Early reduction and protection of full weight bearing by use of the brace are advocated on this basis.

Bibliography

1. Bohler, Lorenz: The Treatment of Fractures. Vol. II. New York: Grune and Stratton, 1957.
2. Elliot, Robert B.: Central Fractures of the Acetabulum. Clinical Orthopedics. No. 7. p. 189-201. Philadelphia: J. B. Lippincott, 1956.
3. Key, John Albert, and Conwell, H. Earle: The Management of Fractures, Dislocations and Sprains. 6th ed. St. Louis: C. V. Mosby Co., 1956.
4. Kulowski, Jacob: Motorist Injuries and Motorist Safety. Clinical Orthopedics. No. 7. p. 243-345. Philadelphia: J. B. Lippincott, 1956.
5. Pipkin, Garrett: Treatment of Grade IV fracture dislocation of the hip. J. Bone & Joint Surg., 39a:1027, October, 1957.
6. Ritchey, Sterling J., Schonholtz, George J., and Thompson, Milton S.: The dashboard femoral fracture. J. Bone & Joint Surg., 40a:1347, 1958.
7. Stewart, Marcus J., and Milford, Lee W.: Fracture dislocation of the hip. An end-result study. J. Bone & Joint Surg., 36a:315, 1954.
8. Thompson, Vernon P., and Epstein, Herman C.: Traumatic dislocation of the hip. J. Bone & Joint Surg., 33a:746, 1951.
9. Urist, Marshall R.: Fracture-dislocation of the hip joint. The nature of the traumatic lesion, treatment late complications and end results. J. Bone & Joint Surg., 30a:699, 1948.
10. Watson-Jones, Reginald: Fractures and Joint Injuries. Vol. II. Fourth ed. Baltimore: William and Wilkens, Co., 1955.

Diffuse Pulmonary Emphysema

A Study of Surgical Treatment

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DIFFUSE PULMONARY emphysema is one of the few diseases which have not yielded to the therapeutic advances of recent years. Since it is most commonly a disease of advanced age, the progressive increase in longevity has produced an ever-enlarging number of patients suffering from this condition. Medical therapy with bronchodilators, expectorants, et cetera, provides symptomatic relief in a certain percentage of cases, but it does nothing to improve the basic architectural abnormality.

The principal ventilatory difficulty is in the expiratory phase. In the attempt to open the bronchial airways, the patient tends to maintain his lungs in a hyper-inflated state and to do his breathing at the "top" of his tidal volume. As a result of the latter, there is a great increase in residual air and ventilatory dead space, and inefficient intrapulmonary mixing of air. Because of the lowered and flattened position of the diaphragms, the patient tends to expend a disproportionate amount of his breathing effort in thoracic expansion, an effortful and inefficient method as compared to diaphragmatic breathing.

Considering these factors, it seemed that the mechanical abnormality could be improved by surgically decreasing the size of the lungs. In this way, the diaphragms would be allowed to assume a more normally elevated position, the rib cage could resume its customary obliquity, and the augmented negative intrathoracic pressure would tend to hold open the bronchi, allowing easier expiration. This method has been proposed and used in a series of patients by Brantigan[1] with apparently good clinical results.

Method of Study and Therapy

A battery of cardiopulmonary studies is performed before and after surgery, recognizing the well known inability to accurately assess the value of a procedure by asking a patient "how he feels." These tests have included spirometry and bronchospirometry, determination of residual air, and cardiac catheterization with measurement of pulmonary artery pressure, arterial and venous oxygen saturation, and cardiac output at rest and with exercise. Recently, analysis of lung compliance has been included in this program.

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Patients have been selected for treatment on the basis of a history of progressive pulmonary insufficiency, chest x-rays indicating diffuse bilateral emphysema, and pulmonary function studies confirming the diagnosis of obstructive impairment of ventilation. No patients have been rejected because of severity of disease and the procedure has been carried out only in patients in whom disability was well advanced. The maximum breathing capacity of those operated upon has ranged in the vicinity of 27 to 39 per cent of expected normal. It has been empirically thought that the procedure would offer most to the younger patients, although gross estimation of a patient's physiological age is more valuable in this respect than chronological age. The patients operated upon have ranged from thirty-nine to sixty-seven years in age, the youngest representing a "juvenile" form of this disease which is in all pathological and functional respects similar to that seen in more elderly patients.

The surgical technique is simple. Operation is carried out, or planned, for both lungs, the second side being done several months after the first. Through a small thoracotomy incision peripheral sections of all lobes are removed by a simple wedge technique, excising the tissues distal

to a long curved clamp, or series of clamps, and oversewing the cut edge. It has been our experience that the disease is almost never truly symmetrical and tends to be worse at the apex of the lung and at the peripheral edges of the lobes, and an attempt is made to resect the most involved portions. When blebs or cysts are present, these are also excised. This procedure is continued until by gross observation the lung appears to fit comfortably within the thoracic cage or until the surgeon has removed as much tissue as he feels is safe without danger of inordinate air leaks postoperatively. Only experience will provide judgment in the amount of lung tissue which can safely be removed. By crude estimation, it has been considered that as much as 30 to 40 per cent of the gross lung volume has been exercised. In the interest of "setting" the diaphragm at a high level for maximum excursion and to lessen the air leaks by allowing lung to come against parietal pleura, pneumoperitoneum has been used in several cases beginning immediately after operation. This is maintained until air leakage has stopped and the patient is active and ambulatory and then is allowed to absorb.

Results

Despite the extremely poor functional condition of these patients and their well known difficulties during other types of surgery, it has been our experience that the procedure has been surprisingly well tolerated. It is usual to find that immediately postoperatively the patient's ventilatory effort appears to be decreased and his dyspnea lessened. It has been usual to observe rather free leakage of air from the cut surface of the lung, despite attempts at meticulous over-sewing, but in no case has this persisted for longer than nine days. No complications directly attributable to surgery have been seen to date and there has been no instance of postoperative pulmonary insufficiency. This may be due to the fact that our series is small and chance has played a part.

Results to date have been encouraging. All patients have claimed substantial subjective improvement and have shown grossly observable benefit as indicated by ability to carry on increased activity without dyspnea. Subjective improvement has been considerably more striking after the first stage than after the second, but this is reasonable when one considers the extreme disability of these patients; the improvement resulting from the first operation has frequently restored them to a state of comfort with moderate activity, and the second operation cannot be expected to provide as noticeable additional relief.

Only preliminary impressions may be given from the functional studies performed on these patients since the series is still small and the final evaluation in some patients is not complete. A slight improvement has been seen in maximum breathing capacity and vital capacity. In most cases, this improvement has been inadequate to account for the subjective improvement claimed. However, as one might anticipate, there has been a substantial reduction in the residual air compartment and it is probable that this accounts for the evident clinical improvement. In the catheterization studies, it has been a consistent finding that even though the pulmonary artery pressure may be normal at rest, there is usually a marked increase in the pulse pressure and a moderate increase in the mean pressure with exercise. This increased pulmonary resistance may be related to an observed inability to increase the cardiac output in response to exercise (in many instances there is an actual decrease in cardiac output during exercise). No final catheterization studies have been done at a sufficient time after surgery to indicate whether these changes in pulmonary resistance will be improved by the procedure. One patient, whose condition had progressed to cor pulmonale with overt heart failure, was operated upon with considerable subjective improvement from a unilateral procedure, although the degree of heart failure has remained approximately the same. Whether ultimate benefit can be provided in such patients is questionable, and one of the objectives of the study program is the attempt to determine which patients will be improved by surgery.

It should be emphasized that, although the initial studies have been encouraging and the low mortality and evident subjective improvement have stimulated us to continue the study further, it is not recommended that this method be adopted as a therapeutic procedure, and that it should be performed with the clear understanding that it is being carried out on a trial basis.

References

1. Brantigan, O. C., and Mueller, E.: Surgical Treatment of Pulmonary Emphysema. Am. Surgeon, 23: 989, 1957.

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Preventive Psychiatry—Present Status and Future

Here is a provocative presentation of the enigmatic. The concepts discussed should stimulate further fruitful study.

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INCREASING concern, interest and publicity in the field of mental health frequently raises the question among physicians and personnel working in this field as to what we know about preventive psychiatry at this stage of development, or what can we do in the way of prophylaxis against mental illness. The first question to be raised, although there is no specific answer, is what is mental health? At the present time, mental health is merely a concept since no one has been able to limit it to an empirical experience; yet, the values attributable to this concept vary. Thus a society placing peace and equanimity as the highest good will define mental health as tranquility; thus there will be more tolerance for resignation, withdrawal and other schizoid variations. If it is believed that man's role is primarily to work and accomplish, the mentally healthy will exclude those not productive. Those who believe that the healthy person is one who enjoys himself would consider others not able to experience pleasure as sick. Others have believed that it is man's role in life to suffer and purge himself, and that this is why he was born; thus those who suffer least would be considered images of mental illness.[1] These attempts to attribute certain values to mental health concepts are mentioned in an effort to by-pass them since the cultural relativity and impasse reached in determining the "good" inevitably results in endless unanswerable questions about what the "good" is. It is possible for various criteria to be discussed in terms of psychological meanings, and the lessened significance of judging mental health by the value approach is seen if it is remembered that it is merely one of many goals existing simultaneously, and that it should not be the aim of preventive psychiatry to mold the future for all civilizations.[2]

Historically, "mental hygiene" was suggested by Adolf Meyer in referring to the theme of Clifford Beers in *The Mind That Found Itself,* but it was used previously by William James in a lecture at Cambridge on "The Gospel of Relaxation."[3] Each of these three men had in mind a different approach to mental hygiene, and this is still present in contemporary work in this area. At the present, the approach of Beers seems most archaic, for he considered mental hygiene analagous to hospital reform programs with almost no stress on preventive aspects. James believed mental hygiene to be a promotion of a program of mental well-being so man could live a fuller life, whereas Meyer believed it was not just improved treatment of those mentally ill or promoting mental health, but preventing mental illness that was the crux because "this is the only effective cure known." Dr. Meyer also pointed out the two great obstacles that faced

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the development of a mental hygiene movement. First there was a dogmatism and attitude of proprietorship which could be found in the church, school and university faculty each of whom believed to hold the human part of human nature in its grasp by means of the "humanities" in contrast to merely "natural science," and each of whom claimed to know from tradition and revelation all that was worth knowing about man and life. Second and equally stultifying was the rigid professionalized dogmatism of medicine and natural science which represented a mechanistic materialism and elementalism, orthodox and extolled as long as it left the mind, soul and behavior to philosophy and religion.[4] Today one is not impressed so much by these attempts to restrict a mental health approach, except in a few cases of extremism or the unsophisticated. There is more of a demand put on this new field to bear the responsibility and take the blame for the gaps and deficits now existing, whether this be due to an abrogation from failure of the traditional approaches, or the success of the new approaches ready to incorporate in its new techniques whatever was useful in the former.

Anyone having to deal with preventive psychiatry cannot avoid facing the problem of what mental health is or is not. Apart from obvious extremes there is no agreement on what types of behavior should be considered sick, and anthropologists remind us that what is accepted in some cultures would be regarded as sick in our civilization, but further what would be accepted in one part of our own country would be sick in another part. The question also arises as to whether personality disorders and problems of delinquency should be classified with mental illness. Dr. Jahoda has raised many questions concerning the nature of mental health and many of the concepts discussed below are suggested by her analysis.[5] The first question that must be raised is whether mental health can be considered equivalent to the absence of mental disease. Those who object to such a proposition base their main argument on the fact that it does no good to define one concept in terms of another where the meaning of neither of them is clear. The opposite view would seem to be that which the majority of physicians hold from their patho-physiologic orientation. As Barton states, the physician "sees health as the objective in the prevention, cure or management of disease to the extent that he can help the individual avoid it, recover from it, or compensate for it," and "mental health above the mere absence of disabling illness has yet to be scientifically demonstrated."[6] Those who think of mental health in this manner usually lay stress on the biochemical-physiological prerequisites of behavior and think of restoring a homeostasis for organic and emotional behavior. Attempts to use normality as equivalent to mental health also run into difficulty as it is a well demonstrated fact historically and medically that normality may not be the status of the majority of a population. Any such statistical definition of mental health has to select a reference population which involves a non-statistical concept of health as in selecting a group one is considering its performance from a mental health viewpoint; even when a population is selected, the problem of weighing different psychologic functions according to mental health importance must somehow be decided upon.

Much effort, most of it fruitlessly, has been expended to define mental health in terms of happiness. The World Health Organization has defined mental health as a "state of well-being" without any further specificities as to what the latter is. Even men like Menninger and Ernest Jones have listed happiness as one of the criteria for mental health. "Let us define mental health as the adjustment of human beings to the world and to each other with a maximum of effectiveness and happiness,"[7] and, "We have to consider happiness the most important attribute of normality . . . not simply pleasure but the capacity for enjoyment with self-content."[8] The limitation in this approach is the realization that happiness is not dependent on only the individual since many environmental aspects creating unhappiness are beyond individual modification. Social conformity may put demands on a person inconsistent with his self-content, and he must then choose between mental health or conformity.

Many psychological criteria have been suggested for mental health and some of these will be briefly mentioned. The concept of self-realization or fulfillment is one of the most frequently mentioned approaches to positive mental health. It is phrased in many different ways by different writers from Freud's life instinct to Allport's growth motives.[9] One must evaluate the individual here relevant to his using his potential to the best advantage he is capable of, not merely in an intellectual sense but in terms of how a person is progressing toward his objectives in any sphere. By this it is not meant

to consider healthy those activities done to promulgate self-importance, and "in view of the huge importance of cognitive and esthetic satisfactions in civilized human beings, it is safe to say that routinized education and amusements can have a terrific effect in stunting the growth of healthy personalities."[10] Another closely related concept of mental health is in terms of the individual's attitude toward himself usually described as self-acceptance, self-reliance or self-confidence. This takes in various meanings from ease of accessibility of the self to consciousness, objectivity to make a detached evaluation of oneself, and "accepting oneself" as one objectively is (not implying the negation of striving aspects). Jones has described this in terms of fearlessness, "but we must be clear that we mean by this not merely manifest courage, but the absence of all the deep reactions that mask unconscious apprehensiveness. Where these are absent, we have the willing or even joyful acceptance of life, with all its visitations, that distinguishes the free personality who is master of himself.[11] It would seem that the many descriptions currently popular of autonomous individuals are attempts to describe the self-reliant person such as Riesman's "inner directed" individual, Fromm's "productive orientation," Rogers' "fully functioning individual," and Lindner's "rebellious individual." There have been many tests developed to test one's self-attitude from therapeutic interviews to personality tests, but the validity must be questioned in terms of how relevant the procedures are in terms of evaluating mental health, how unnatural are the conditions of testing compared to one's performance in daily living and how valid is the best qualified observer to judge mental health.

Some mention must be made of psychoanalytic thinking on mental health as a means to self-realization and self-accessibility. The outlook of Freud towards preventive mental health was quite pessimistic, a reflection in part of his own personality, but also from his system which held the individual torn between instinctive id-impulses and the rigid inhibitions on these impulses by a restricting external world and a punishing superego. Freud thus regarded a painful adjustment to the cruel reality in which some satisfaction could be obtained and a holding in check of unsatisfiable impulses, "abandoning the pleasure principle," as the only life compatible with mental health. Any other mode of adjustment was regarded as conducive to pathology. This approach stemmed from his holding the ego merely a mediator between impulses of the id and external reality by controlling impulses from the internalized restrictions of the superego. However, many present-day orthodox analysts believe the ego to have a more dynamic role in the mental health of the individual which makes it capable of a more active role on its own part instead of just playing the role of a mediator, envisaging a resolution of mental conflicts not just based on stoical resignation.[12] Thus, Hartmann considers any balance of forces with ego-domination as unsatisfactory. He believes it was inaccurate to consider the most rational (ego-dominated) individual as the most healthy; a healthy ego is able to make use of a system of rational control, but it must also incorporate the irrational as an element in its design, maintaining a mobility or plasticity that allows the balance of forces to shift as needed.[13] Kubie postulates mental health when the conscious-preconscious systems dominate behavior as contrasted with a predominant unconscious origin from unconscious conflicts in which there is a lack of flexibility that freezes behavior into patterns of unalterability, and which predetermines its automatic repetition irrespective of the utility of the acts or thoughts. "The implicit ideal of normality that emerges from this hypothesis is an individual in whom the creative alliance between the conscious and preconscious systems is not constantly subjected to blocking and distortion by the counterplay of preponderantly unconscious forces, whether in the prosaic affairs of daily life, in human relations or in creative activity."[14] Many of these general concepts have been mentioned by others on a lower level of explanation without reference to the theoretical framework of psychoanalysis by referring to a person's ego strength, frustration tolerance, anxiety tolerance, delaying gratification, resistance to stress, as being criteria for mental health.

Mastery of one's environment must be mentioned as it is an often quoted standard of mental health, although its closeness to self-actualization and dependence on self-reliance is obvious. Under this heading are ranged adequacy in love from the ability to experience sexual pleasure[15] to efforts and processes at problem solving. Many of the neo-Freudian contributions by Horney, Fromm, Sullivan *et al* are concerned with impaired interpersonal relations interfering with the ability for environmental mastery. They also lay stress on the

socio-economic and cultural forces conducive to health or illness. Recent work along this line has stressed man's alienation from himself and his fellow men, resulting in an existential anxiety with the facade or semblance of productive activity being a meaningless "keep busy" to avoid facing the reality of oneself.[16]

It has been thought necessary to give an introduction dealing with various aspects of what mental health is considered to be, but it would seem that mental health means many things to different people. There are as yet no specific qualities that one must have to be mentally healthy. Perhaps at the present time the most workable approach would be to accept different types of mental health, not all compatible with each other simultaneously except in an idealized setting, but various aspects of which can be prominent at different times. This would accord with the proposal of Smith for optimal mental health as contrasted with attempts at maximization of every possible function.[17] Then for each situation limited by the individual and his cultural milieu there would be not just one set of criterion values, but a family of such sets to be evaluated in terms of reaching varying degrees of potential with each other.

II

Concepts of detection and prevention are necessarily tied to the epidemiology of mental disease. There is a common feeling that little is known about epidemiology from a tendency to remove from the concept of mental illness those diseases on which epidemiologic knowledge can lead directly to programs for prevention; thus organic diseases such as paresis, traumatic psychoses, post-encephalitic or meningitic psychoses, mental disorders produced by poisons and drugs such as steroids, bromides, isoniazid, belladonna and thiocyanates are often excluded when the problems of detection and prevention are discussed although there is an understanding of the effects of these processes, and programs to avert mental sequelae have been in action for years. Yet, it is true that in regards to these conditions it has been the general progress of medicine that has provided epidemiologic advancement and not preventive psychiatry *per se*. It is also true that the most numerous mental diseases still resist a basic understanding from an epidemiologic point. Considering the most elusive and prevalent psychosis, schizophrenia, there are many factors that hinder preventive programs: (1) Basically, the diagnosis of this disease rests on a clinical evaluation of the patient, the same as some hundred years ago, and even though we have more knowledge about the disease, this is never as reliable as a more objective test to support clinical impressions. At least to the present time no clinical or biochemical test has proven diagnostic. (2) The early manifestations and symptoms of schizophrenia are not fully known and are very difficult to recognize, resulting in progressive cases that are first seen by psychiatrists. Mild cases and the pseudoneurotic form are particularly difficult to detect early. (3) Detection of the disease is also difficult because we do not yet have criteria to say when a person is "officially" schizophrenic.[18] Some can become so in months, weeks and sometimes in a few hours. Thus, the problem arises as to when the person is schizophrenic. Has he just become schizophrenic at the point of his breakdown, or some months previously, or is this just the manifestation of a hereditary tendency and the person has been schizophrenic since the instance his mother's ovum was fertilized by his father's sperm? (4) Even trained psychiatrists vary in their diagnoses of this disease by 30 to 60 per cent, and the diagnosis is thus still unfortunately far too subjective. Some would say the psychological tests should be the laboratory data in psychiatry, but it must be realized that these tests are not on the level of accuracy of the usual medical laboratory work. As they depend on clinical data, conclusions drawn from them are always somewhat circular and subject to the same limitations and subjectivity as clinical impressions. There is also the difficulty with personality tests such as the Rorschach, TAT and MMPI, that patients may co-operate poorly, cover up queer ideas, and yield little workable material to help in differentiating schizophrenics from non-schizophrenics. A point has also been made that personality tests are usually validated against psychiatric diagnoses and therefore can only be used validly to predict which label the psychiatrist who took part in the validity study would have assigned to a patient. If a psychological test "confirms" one's diagnosis, it does not mean one can make a prognosis or decide on treatment with any more confidence as the test has not been validated for that purpose and no correlation shown with prognosis or treatment.[19] (5) We do not know what the etiology of the disease is, whether it is a purely psychogenic disease or due to a metabolic imbalance in the body, or both, or if

hereditary factors are involved or not although each of these viewpoints has ardent, even though not always scientifically inclined, advocates. The question of single or multiple etiology is simply not known at the present time. In fact, even the basic symptoms of the disease are not known. The formulations of Bleuler, made in the nineteenth century, are very probably outdated although they continue to be taught in medical schools with very little having been added to them. (6) We have inadequate criteria for evaluating improvement. It is estimated that about one-third of the patients released from mental institutions who "were" schizophrenic have a relapse, and we do not know if they have just adapted better to their environment while remaining as sick as before, or if the environment adapted itself to a schizophrenic.[20] It seems evident the atmosphere in our hospitals is one to encourage the helplessness and regression of the patient, and actual improvement relevant to how a patient will do in a less artificial setting is difficult.

With all these deficiencies in our knowledge of this disease, one might conclude that the situation was hopeless. Yet, considering all aspects, it might not be. It is known that public health has eradicated many epidemic diseases with insufficient knowledge of exact causes, and many facts are known about mental illness on which to work. Perhaps key links in the natural history of mental illness can be identified, or modifiable environmental features can be observed. There are many areas where this has happened, such as with nutritional deficiencies. The exact mechanism of how nicotinic acid prevents pellagra is still unknown, yet the number of pellagra psychoses has been cut immensely. Delirium tremens is another area where the etiological factors related to alcoholism are still obscure, and some have suggested putting our resources into maintaining the nutrition of alcoholics that might prevent delirium tremens, at least until more is known about causation.[21] Similar programs have been successful in relation to toxic psychoses and infectious precesses. With a disease such as manic-depressive states, there appears to be methods of reducing the length of the illness or at least arresting its progress through electroshock combined with psychotherapy. One study feels there is evidence that monthly shock treatments given to schizophrenics delay remissions, but many patients may resist receiving shock monthly when they feel well, and such prophylaxis may not always work.[22] There is always the possibility that early treatment with tranquilizers may limit the development of certain mental illnesses and much recent work has been in this direction. If one judges by the wide generalities made for each new drug as it appears, one would believe this was eminent, but as with all other new approaches, the apparent results may be due to the "Hawthorne effect" of receiving special attention and increased social stimulation.[23] Despite these *ad hoc* procedures, it is evident that a more fundamental approach must be undertaken, particularly if such conditions are to be detected and prevented before they occur. Gruenberg feels that one of the best ways to systematically prevent mental disorder is by working with those who have been in a mental hospital with a psychosis since this group has a very high rate of psychoses that produce total disability, and according to his data,[24] a small amount of clinical and social energy could reduce the rate of relapse by one-third in these people. There must be a thorough follow-up of discharged patients to prevent relapse and deterioration, and this appears to be a present weakness which merely dispensing tranquilizers at stated intervals does not eliminate.

A few words must be said about the difficulties inherent in mental hygiene work, and why there has been such a lag in progress. Some feel that this is an area not subject to any quantifiable observations, but the problems arising are as factual as those in a more restricted field with less variables. Lemkau points out the similarities and differences between the immunologic changes and temper tantrums that go with a case of pertussis where "the immunologic reaction, occurring at a level of integration comprehensible in terms of chemical reactions, is determined with laboratory tools and away from the patient, whose only contribution is a blood sample. The temper tantrum, however, may not be observable by the person required to evaluate it, since in our culture such reactions tend to be concealed as private family matters. . . . The evaluation of the severity or even the presence or absence of tantrums will have to be on the basis of the prejudiced account of a biased witness. But the difficulty of the evaluation does not change the essential character of the fact or relieve the scientist from taking it into consideration."[25] Other limitations to progress in the field are due to the lack of any suitable experimental animals. Attempts have been made to observe

artificially produced neuroses in animals, but this is a great distance removed from observing changes in blood sugar in animals following insulin injection for example. The results of experiments on humans is thus subject to ethical limitations, and also suffers from the results having to be indicated in language which brings up semantic problems. Many experiments in mental hygiene need generations for observation before conclusions can be drawn, just as in other areas of experimental medicine where laboratory animals suffice, and the limitation here is obvious. Only within the last few years have studies been organized so observations of individuals can be made over a long-time period where significant factors can be singled out for evaluation; and even here the methodology in personality evaluation is changing rapidly so that standardization of methods in long-term experiments is difficult. Experiments are most valuable if the variables can be controlled and the experiment repeated. But this is never possible with man, at least in observations over any length of time. There is also the problem of comparing clinical results from one era with another, and from different clinics. Questions of statistical comparison make interpretation hazardous such as in considering when a case becomes a case; some studies consider a patient a case when he appears at a clinic, while others consider a patient a case after the completion of intake processing, which itself may vary from assigning a case by rotation, following minimal identifying information, versus a complete history, physical and psychiatric examinations, and psychological testing.[26] Data collected by various approaches may vary the figures obtained. Thus, the "closed case" method, taking cases closed during a given period, may give results different from the "open" method where cases opened in a stated time interval are followed, and both may differ from the "survey" method where the cases in treatment on a specific day are followed up and considered a typical cross section.

Some of the blame for inadequate progress must rest with the paucity of work that has been going on in basic research on mental health and disease due to the small number of psychiatrists engaged in this work. It is well known that academic psychiatrists are below par financially and prestige-wise compared to those in private practice, and in other professions. The public and many physicians seem to regard the man who enters an academic career as one who could not make good in private practice. The feeling that we had enough basic data on behavior and neurophysiology, with an increasing awareness by the public of mental illness, led to pressures and emphasis for immediate results with a neglect of basic research for applied science. However, the incidence or recurrence of mental disease has so far not decreased even though discharge rates from hospitals have improved. Out of a total federal budget of $77 billion in 1960, only $5.5 billion (7 per cent) is being spent on research and development, and out of this only $500 million (0.65 per cent) is for basic research.[27] Ruesch stresses the atmosphere in the United States that militates against basic research which has those showing promise in an academic setting being shifted into an administrative position, such as deans or department heads, with greater prestige, and serving as the model of achievement for students and younger men as an organizational administrator and not a research scientist. He notes that most creative ideas and themes in psychiatry have originated in Europe, and adds that "no medical, psychiatric or scientific discovery has ever been made by a bureaucrat, nor has he ever advanced new theories or points of view."[28]

There is the problem of whether it is possible to prevent or change attitudes that are inimicable to the mental health of individuals, and much controversy has arisen over whether personality changes are truly possible which penetrates to the heart of the question, if such a thing as preventive psychiatry can ever be a successful actuality. One view is that the developmental stages are quite fixed once they have occurred, such as in infancy, oedipal and latency periods and true modification can only come from depth procedures such as psychoanalysis. To adopt this view is to become extremely pessimistic, for the applicability to a large segment of the population of such a procedure is impossible, not only from the financial limitation, but from the inadequate number of psychoanalysts and the limited number of people that qualify for a successful analysis. The question then arises as to the efficacy of environmental educational influences. Psychoanalysts would probably agree that even if everything went relatively well up to latency, social factors may still have a severely disturbing impact, and the concept of regression would exemplify such a personality change as the result of a particular environmental stress in later life.[29] The crucial importance of

community influence is seen by its impact on parents as they will transmit this influence to their children from birth on, and through behavior changes demanded by environmental pressures which may establish permanent patterns.

Basic to any preventive program for mental illness is getting at the attitudes of people. Attitudes may be regarded as the emotional and intellectual make-up of a person that determines his beliefs and reactions to opinions and facts bearing on these beliefs. The important thing about attitudes is that their origin and development is largely unconscious and from periods of life no longer within the range of memory. The person holds these attitudes not as subject to being proved, but as right because they are right; he rejects any suggestion that they are capable of interpretation on the basis of past personal experience and argues about them on some falsely logical ground. A deduction from this explanation is that as all attitudes have an emotional component, they can be changed most effectively only when emotional approaches are used in the procedure of change. For correction of basic factors important in the development of mental illness, the emotional factors underlying the attitudes will have to be dealt with, and some sort of corrective emotional experience along with logical explanation is needed if fundamental changes in attitudes are to be expected. The application of mental hygiene principles in an attempt to modify these attitudes in different fields will be discussed below.

Even though psychoanalysis is not available for the majority of the population, many of its conclusions have a direct application to the problem of mental health, for it is by utilizing many of its techniques and derivations therefrom that an evocative approach, that has been mentioned above as crucial to any successful mental hygiene program, may be used to reach people. It is admitted that one great advantage of the original Freudian view was that it discouraged the unrealistic optimism that subsequently developed about solving the problems of mental illness. Such a view was not conducive to many positive programs along preventive lines, but it did provide the stimulus for finding out more of the complexity of the human mind, and it developed principles that have direct bearing in the mental health movement, although the acceptance of such scientific foundations was dependent on the historical pioneer work of people like Philippe Pinel, Dorothea Lynd Dix and Clifford Beers. Among the principles of preventive psychiatry which have been developed are the following: (1) The support of parents in the control of a child's impulses until he acquires the power to control them himself, and that in the absence of such support, he becomes the prey of pathogenic anxiety. (2) The importance of home conditions calculated to promote the general emotional maturity of a person. (3) Anticipate the trauma associated with separation from the mother, birth of a sibling, or an operation so the child will not meet it unprepared. (4) The emotional need of the child for attention from both parents. (5) The importance of safe-guarding the child against situations calculated to promote jealousy. (6) Educating parents to not force toilet until the child is psychologically capable of responding. (7) In matters of discipline, understanding the child's needs rather than using rigid discipline. (8) The importance of safe-guarding the child against any risk of being a witness of sexual intimacies between his parents. This includes avoiding premature excitation of sexual feelings and avoiding exaggerated condemnation if it occurs. In line with this principle is a recent law in Israel that forbids the appearance in court of a child under fourteen years of age who has been sexually assaulted as it was realized that there may be more suffering from appearing in court and being cross-examined than from the actual assault episode.[30] This clinical knowledge must be applied for constructive social health through a program of education for and through our social institutions that reach children such as the family, school, church, et cetera. The more that is learned about the psychological needs of children and the demands our society puts on them, the more it becomes obvious that education should focus upon, and develop the potential resources of, individuals in ways that fit them for participating in work, family life and citizenship. This educational task is gigantic and needs much planning, personnel, research and financing, but to ignore it may have consequences analagous to the failure of our government to undertake the needed support for the development of other scientific and educational programs.

(To be concluded in the May issue)

The Minnesota Academy of Medicine

An Historical Account

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THE FIRST scientific meeting of the Minnesota Academy of Medicine was held on October 12, 1887. The period from then until now has seen greater progress in medical science than did all the preceding ages. To cover the Academy's more than seventy-year history within reasonable time limits permits only a very summary account. I have chosen to focus this brief history on the progress in medical thought during the society's lifetime as indicated primarily by certain selected presentations made at its meetings. For this purpose, I have drawn on the ten volumes of Academy minutes on file in the Manuscript Department, Minnesota Historical Society, and on the excellent summary of the society's first thirty years given in the presidential address of Dr. Arthur S. Hamilton[1] in 1923.

The Academy's Beginnings

On October 1, 1887, Dr. John F. Fulton of St. Paul came to Minneapolis to enlist the help of Dr. A. W. Abbott in founding a society of those physicians interested in original work. The two invited a group of physicians from the Twin Cities to meet on October 7, 1887, at the West Hotel in Minneapolis.† At that meeting temporary officers were elected, and the responsibilities of selecting a membership list of Twin Cities physicians and of drawing up a constitution and by-laws for the new Minnesota Academy of Medicine were assigned.

At the first scientific meeting on October 12, 1887, the twenty-three members present elected the following slate of permanent officers: Dr. John F. Fulton, President; Dr. A. W. Abbott, Vice President; Drs. Richard Olding Beard and Edward C. Spencer, Secretaries; and Dr. LeGrand N. Denslow, Treasurer.

At the Academy's second meeting, held at the Ryan Hotel in St. Paul on November 5, 1887, Dr. Fulton as President advised all members to have "something to say" and to say it briefly. He continued his inaugural address by stating, "A so-called specialist whose education is not well founded in the art and science of general medicine is not worthy of recognition by the profession."

From 1888 to 1900

A thesis entitled "Sepsis and Antisepsis in Mid-Wifery" was read by Dr. A. B. Cates in January, 1888. Dr. Cates pointed out that only seventeen years had passed since the first attempt at antiseptic midwifery, only six years since corrosive sublimate had been used, and only four years since thorough and complete antisepsis had been observed. Yet as a result of this advance in technique, the death rate from puerperal infection had already been dramatically reduced—from 11 per cent to less than 0.5 per cent.

On May 4, 1889, Dr. C. H. Hunter read a paper entitled "A Note upon intubation," reflecting the interest in that subject since four years earlier when Dr. Joseph P. O'Dwyer of Cleveland described the use of his new intubation tube designed with a bulge to prevent easy expulsion and a lip to preclude loss of the tube in the trachea.[2]

In December, 1890, Dr. James E. Moore presented a specimen of a plaster dressing to illustrate the tightness and firmness of this apparently new type of dressing. White of egg applied to a bandage and allowed to dry was commonly used in the early days to furnish a supporting dressing.

Dr. William J. Mayo read a paper in 1890 entitled "A Discussion of Some Features of Peri-uterine and Perityphlitic Abscesses."[3] He had operated upon ten patients with perityphlitic abscess following ulcerative appendicitis, with nine re-

Read before the Minnesota Academy of Medicine on April 9, 1958.

†The group included: Drs. Allport, Abbott, Beard, Bracken, Braunsteen, Dunn, Hall, Hunter, and Wells of Minneapolis; and Drs. Denslow, Fulton, MacLaren, Millard, Owens, Riggs, and Spencer of Saint Paul.

coveries and one death; and he had treated six patients with periuterine abscesses—three by a mid-line incision and three by vaginal drainage—with six recoveries. For years the average physician, satisfying himself in these two conditions with a diagnosis of inflammation of the bowels, had prescribed laxatives and enemata. Dr. Mayo stated that the best time to operate was difficult to determine but that adhesions might limit the process and make the period from the fourth to eighth day period the optimal time. Both Dr. Mayo and Dr. Reginald H. Fitz, in his monumental article on appendicitis[4] written four years earlier, were advocating the operative treatment of the complications of appendicitis; and it was not until later that physicians realized the importance of operation before complications had arisen.

The celebrated Dr. William Osler of Johns Hopkins was a guest at the October 5, 1892 meeting. After a dinner given in his honor, the meeting was adjourned to the chamber of the House of Representatives at the old State Capitol where some 200 members of the medical profession assembled to hear Dr. Osler speak on "License to Practice." In 1893 he was elected an honorary member of the society. Another illustrious physician, Dr. Charles H. Mayo, was elected to associate membership on January 4, 1893, and he read his thesis on "Skin Grafting" on March 1, 1893.

In March, 1896, Dr. C. G. Weston read his inaugural thesis on "Antitoxin Treatment of Diphtheria." Three years before, in 1893, the German Emil A. von Behring, had first prepared diphtheria antitoxin and in 1894 had made it generally available.

In October, 1896, Dr. Perry H. Millard extended an invitation to the members to attend at the University of Minnesota a semi-centennial celebration of the discovery of anesthesia.

Another paper by Dr. William J. Mayo was given in February, 1898, entitled "Observations upon the Diagnosis and Surgical Treatment of Certain Diseases of the Stomach." It reveals his early interest in stomach surgery. These observations were never published, and from the discussions which were published one cannot be certain that his advocacy of gastroenterostomy for duodenal ulcer began as early as 1898. A few years later, however, Dr. Sippy of Chicago recommended medical treatment of peptic ulcer with alkalis and frequent feedings. Feeling between the two camps—surgical vs. medical treatment—was occasionally intense. A generation or so later, in his address before the Academy on May 8, 1935, Dr. Donald C. Balfour of Rochester gave an excellent presentation[5] of the indications for surgical treatment of ulcer; with the improvement of medical management by this later date, a smaller percentage of cases had come to require surgery.

From 1900 to 1910

In June, 1900, Dr. Rothrock reported on a case of thrombosis of the coronary artery with sudden death (not published). This was twelve years before Dr. James B. Herrick of Chicago was to publish his famous article, "Clinical Treatment of Sudden Obstruction of the Coronary Arteries,"[6] which pointed out that the coronaries are not end arteries, and that recovery from thrombosis of these arteries frequently occurs. I was not able to find any record of a paper on coronary thrombosis having been presented during the decade after Herrick's article. A fine paper,[7] however, on the differences between angina pectoris and coronary occlusion was given by Dr. S. Marx White at the April 11, 1934 meeting.

The Academy took part in the agitation for a state-supported tuberculosis sanatorium. Certain medical groups vigorously opposed such an undertaking on the ground that the state would be entering into the practice of medicine in an unwarranted field. Dr. Henry Longstreet Taylor, a member of the Academy, was among the first physicians, if not the first physician, in this state to specialize in the treatment of tuberculosis. The belief that the ozone of Minnesota's pine woods had a healing effect on pulmonary tuberculosis had induced many sufferers to move to Minnesota. Dr. Taylor became convinced that the treatment of tuberculosis—consisting in those days largely of prolonged rest, full diet, and often absurd amounts of fresh air—was not attainable for the average patient with family responsibilities. He therefore led a crusade, writing articles for the public and speaking in church pulpits and elsewhere to urge establishment of a state tuberculosis sanatorium. On December 6, 1900, he presented a resolution, which the Academy adopted, asking that the State of Minnesota establish an institution for the treatment of "early cases of consumption."

On May 1, 1901, Dr. J. G. Cross who was then with the Mayo Clinic* presented his thesis[8] on "The Present Status of the X-ray in Medicine and Surgery." The x-ray had been discovered by Roentgen only five years earlier, but surprising progress had already been made in its application to medical diagnosis. Dr. Cross pointed out that the fluoroscope was being used for observing the thorax and its contents; he stated that while the radiograph was of value in locating opaque foreign bodies and fractures of the extremities and even diagnosing kidney stones, the rays were not penetrating enough to produce satisfactory plates of the hip joint, pelvis, or spine. Intrathoracic aneurysms and tuberculous joints and lung cavities could be shown clearly, as could dilatation and diverticula of the esophagus.

On October 7, 1903, Dr. Richard Olding Beard resigned after fifteen years as secretary, and Dr. Arthur A. Dunning was elected to succeed him.

At the January, 1907 meeting, when pediatricians were apparently just becoming cognizant of the condition, Dr. Walter Ramsey described two fatal cases of pyloric stenosis in infants. Nine years later, at the meeting of January 5, 1916, Dr. Arthur A. Law reported on a fatal case of pyloric obstruction in an infant upon whom he had performed a gastroenterostomy. In 1912, Ramstedt,[9] the German surgeon, had advocated simply incising the obstructing muscular ring at the pylorus, a much simpler operation which greatly reduced the surgical mortality in the dehydrated and undernourished infant.

From 1910 to 1920

At the meeting of November, 1910, Dr. Justis Ohage, a member of the Academy, recounted the history of the first complete removal of a gallbladder in the United States; the operation had been performed by him in 1886, and it was reported before the Ramsey County Medical Society (*Medical News,* Feb. 19 and Feb. 26, 1887). Dr. Ohage reported that he had sacrificed the lives of about eighty dogs before attempting the operation on a human patient.

The treatment of syphilis received considerable attention from Academy members. Thus, at the June, 1912, meeting Dr. Woodard spoke on the use of salvarsan in the treatment of this disease, and Dr. John Armstrong stated his belief that that drug constituted the best treatment then available. Two years later, in February, 1914, Dr. Charles D. Freeman presented his thesis[10] entitled, "Recent Advances and investigations in the Treatment of Syphilis with Special Reference to Syphilis of the Nervous System." He stated that syphilis would always be with us unless a way was found to establish immunity by vaccination. Dr. Freeman stated that the treponema could be demonstrated in 80 per cent of primary lesions and that the recent finding of the treponema in the brain and cord in cases of paresis and tabes by Noguchi had proved that these two diseases were of luetic origin. It had not been proved, however, that the treponema in the nervous tissues could be reached by mercury or salvarsan in the circulation or in the spinal fluid. Dr. Freeman was not enthusiastic about the Swift-Ellis treatment then in vogue but since abandoned.

On November 4, 1914, Dr. George Douglass Head introduced a bombshell when he read a paper entitled, "Tuberculosis (concealed): A Heretofore Unrecognized Clinical Type of Tuberculous Infection." He deduced that many neurasthenic symptoms when accompanied by a positive tuberculin reaction were caused by a concealed active tuberculous infection. Other members in discussing his paper felt that the x-ray was more reliable than the tuberculin test in unearthing otherwise concealed tuberculous infection. Dr. Head was so convinced of the importance of his discovery that in 1924, he published a book entitled *Concealed Tuberculosis or the Tired Sickness.* It was subsequently established, of course, that a positive tuberculin reaction indicates previous infection, active or inactive.

While World War I was absorbing the attention of many physicians, several events are noted in the Academy's history. Dr. Arthur W. Dunning, after ten years as secretary and treasurer of the society, was elected president in December, 1915, and died while in office. On March 14, 1917, a silver gavel, made by an eastern silversmith, with the names of the presidents of the Academy engraved upon it was presented to the society by Dr. Frank C. Todd. At the October, 1917, meeting Dr. Robert E. Farr reported some of the operations he had performed under local anesthesia—herniotomies, removal of a tumor from an arm, craniotomy, reduction of a dislocation, resection of an unruptured tubal pregnancy.

*He moved to Minneapolis in 1904 practicing in the field of internal medicine.

Dr. Cornelius Williams died on December 29, 1918. A pioneer in the field of mastoidectomy, at that time the third most common operative procedure, he preferred a dental burr as permitting greater thoroughness than the conventional chisel and mallet, a judgment that time was to vindicate.

From 1920 to 1930

When Dr. Harry P. Ritchie became secretary-treasurer upon the resignation of Dr. Leavett on November 10, 1920, he recommended appointing an official reporter to record the society's proceedings. Miss Goldie Crever took over the duties of this post on April 11, 1921, and has held the position ever since. Miss Crever not only recorded actual proceedings, but also compiled a summary of the activities of the society during its first fifty years, a list of the charter members, the names of the presidents and dates and titles of their addresses, a complete record of meeting dates and places for the first fifty years, and an index of the members' contributions to each meeting. This valuable material, bound in a single volume, was presented to the Academy by Miss Crever at the meeting of January 11, 1939, to remain in the custody of each successive secretary. Other duties of this post have included filing the submitted theses, addresses, and case reports in the minute books which are kept in the archives of the Minnesota Historical Society.

A report on an electrocardiographic and clinical investigation of the therapeutic value of camphor[13] was presented at the January, 1922, meeting by Dr. E. T. F. Richards in conjunction with Dr. R. Edwin Morris. They reported that camphor injected intravenously in dogs led to convulsions followed by a toxic period with a succession of heart block, stoppage of respiration, ventricular and then auricular failure, and finally, periods of ventricular fibrillation. They concluded that camphor does not stimulate the heart, as had been widely held. Dr. F. H. Schultz cited his own experience to support this thesis. He told of taking 2 cc. of camphor in oil orally before breakfast one morning. He reported that as a result his skin had become cold and clammy, he had felt nauseated, his pupils had become dilated, and tremor and a staggering gait developed. For years camphor in oil, injected intramuscularly had been the remedy prescribed when the patient seemed to be dying. It would seem from the experiments cited above, that by injecting camphor in oil the physician in many cases was inadvertently contributing the *coup de grace.*

In discussing an address given before the society at its December, 1922 meeting, Dr. L. C. Bacon told how a well-known physiologist *(sic)* had come to the University of Michigan in the eighties and had been asked by Dr. Vaughn to make an estimate of the capacity of the members of the senior class in the medical school. Among those whom the physiologist considered unfit for the medical profession were Dr. W. J. Mayo and Dr. Walter Courtney (later of Brainerd). Commenting on this obvious failure of judgment, Dr. Bacon suggested that there are many factors in the mental processes of young people which cannot be "measured by rule of thumb." When the society met at the Kahler Hotel in Rochester on November 12, 1925, Dr. John F. Fulton, the first president of the society, made some introductory remarks, and the scientific program was given by members of the Mayo Clinic.

At the September, 1926 meeting, Dr. Henry Ulrich gave his presidential address on "Some Aspects of Hypertension."[15] His definition of essential hypertension and its course is acceptable today: He describes essential hypertension as a definite clinical syndrome which may lead to cardiac failure, vascular accident, encephalomalacia, or renal insufficiency. Arteriosclerosis, he maintains, is not the cause, but rather the effect of the hypertension; the resulting vascular kidney is distinct from the contracted kidney of Bright's disease. He states his belief that a vasomotor center, probably in the medulla, controls the smooth fibers of the precapillary arterioles by way of the vegetative nervous system. Any factor that produces a contraction of the arterioles will narrow the peripheral vascular field and cause an automatic increase in the blood pressure to maintain proper circulation. This may result in arteriosclerosis or in a fixed tonus in the muscles of the arterioles. Cholesterin, he says, is the only metabolite which has been found so far to be increased with any degree of consistency in hypertension, and Westphal feels justified in assuming that cholesterin is a tonogenic substance. Dr. Ulrich's investigation in 1926 of the blood cholesterol in a series of seventy-four hypertensive patients, and his demonstration that by and large hypercholesteremia and hypertension go hand in hand, were

fine examples of pioneering research on blood cholesterol. His presentation in 1926 of the nature of essential hypertension is the conception that has persisted to the present.

At the October, 1926 meeting, Dr. Henry Ulrich reported on an apparently hypoglycemic patient whose wife had to sit up nights feeding him candy and orange juice. Strangely enough, his blood sugar tolerance curve was typical of diabetes. One member predicted that the patient would eventually prove to be diabetic. The patient later went to Rochester and was given continuous intravenous glucose until subjected to surgical exploration. Carcinoma of the islands of Langerhans with metastasis to the liver was found, and insulin was obtained from the liver metastasis. The case was later reported by Dr. Russell Wilder. (On March 13, 1946, Dr. Martin Nordland reported a case[14] of islet cell tumor of the pancreas with recovery from the symptoms of hyperinsulinism after removal of the tumor—an adenoma. Some 150 cases of adenoma of the islands of Langerhans had been reported before Dr. Nordland reported his.)

At the May, 1929 meeting, Dr. Ulrich presented a report of a case of coarctation of the aorta, the first he had encountered. Dr. James S. Gilfillan stated he had been watching for such a case for twenty-five years but so far had not observed one. No other member volunteered any personal experience with this congenital anomaly.

In August, 1929, Dr. Everett K. Geer gave his thesis on "Avulsion of the Phrenic Nerve for Pulmonary Tuberculosis." The discussion that followed brought out that in treating of tuberculosis, rest was still the main objective toward which end the surgical methods of pneumothorax, avulsion of the phrenic nerve, and the mutilative operation of thoracoplasty were all directed.

The first Academy medal, for the most noteworthy contribution to the scientific program of the society during the year, was awarded to Dr. Arnold Schwyzer on December 11, 1929. The medal was awarded not for any one contribution, but for Dr. Schwyzer's reports of his routine work covering a wide field, and for his interesting and constructive discussions of the work of others. Dr. Alexander Colvin made the presentation, and it was he who fifteen years later wrote and read the outstanding tribute to Dr. Schwyzer at the meeting on May 10, 1944, following Dr. Schwyzer's death.

In his presidential address, "Essential Hypertension," given at the January, 1930 meeting, Dr. C. N. McCloud reminded his audience that it was not until 1906 that blood pressure instruments had been perfected for general clinical use, and not until 1918 that the auscultatory method was adopted and the importance of the more stable diastolic reading realized.

From 1930 to 1940

On May 17, 1930, a Founders Dinner was held for the living founders of the society at the Minnesota Club: Richard Olding Beard, J. W. Bell, William Davis, F. A. Dunsmoor, John F. Fulton, W. A. Jones, T. S. Roberts, Frank Allport, Justus Ohage and H. M. Bracken. (Doctors Allport, Bracken, and Dunsmoor were unable to attend.) All the founders present spoke. Dr. Davis pointed out some interesting changes in vital statistics that had occurred since the society was founded. In 1887, cholera infantum had headed the list of causes of death, and along with allied intestinal infections it accounted for 400 deaths in Saint Paul alone in that year. Pneumonia was responsible for half that number of deaths, typhoid fever was third in the list, tuberculosis fourth, and diphtheria fifth. Carcinoma held sixteenth place. Very few babies were born in the hospitals in 1887, whereas four-fifths were born in the hospitals in 1929. In 1887, chloroform and ether were equally used as anesthetics. Bichloride of mercury was taking the place of carbolic acid as an antiseptic; asepsis and sterilization by heat were introduced several years later.

Dr. James Gilfillan read his presidential address on "Compulsory Health Insurance" in January, 1932. He stated that in 1917 the American Association for labor legislation had caused to be introduced in the legislatures of twenty-two states a bill to provide compulsory health insurance to all employes. It stipulated that all administrative expenses were to be paid by the state, and that insurance premiums were to be paid equally by employers and employes. The bill provided the disabled employe with a certain percentage of wages, medical and hospital care, drugs, dental care, expenses of rehabilitation and burial allowance for himself and family in case of need. This legislation if passed would have guaranteed complete health care for all employes and their families through compulsory government insurance with the medical profession in the employ of the

state. Dr. Gilfillan pointed out the continuing efforts that had been made to institute state medicine on a state or national scale since that date.

In May, 1932, Dr. E. B. Foley described his new Foley prostatic excisor which led to improved methods of treating prostatic obstruction.

At the same meeting Dr. O. H. Wangensteen presented his thesis on "Therapeutic Considerations in the Management of Acute Intestinal Obstruction." Dr. Wangensteen's institution of nasal suction in postoperative care and in intestinal obstruction was an original piece of work which brought him international recognition.

The "Status of Obstetrical Practice in Minnesota" was the topic on January 11, 1933, of Dr. J. C. Litzenberg's presidential address. He pointed out that the maternal death rate in Minnesota had become the lowest in the country, having dropped from 7 to 4.3 per 1,000 live births during the period from 1915 to 1929; deaths due to puerperal sepsis had decreased from 2.9 per 1000 live births in 1920 to 1.8 in 1929. (Incidentally, in 1954 only three deaths from puerperal sepsis occurred in 80,580 live births in Minnesota.) Dr. Litzenberg has been given much of the credit for the state's top rank in the field of maternal welfare.

At the March, 1933 meeting, Dr. W. H. Condit spoke on "Trichomonas Vaginalis Vaginitis," a subject that had received scant attention from gynecologists until 1931, when Greenhill[16] made his report on the disease before the Chicago Gynecological Society.

At the March, 1935 meeting, Dr. Harry P. Ritchie spoke on the subject of his special concern and greatest contribution—"The Congenital Clefts of the Face and Jaw." Dr. Ritchie acquired national recognition for his pioneer work in the operative treatment of these congenital defects.

At the same meeting Dr. Robert G. Green presented his thesis on "The Epizoötiology of Tularemia in Minnesota," an outstanding piece of original research. Dr. Green had discovered that tularemia is highly fatal in cottontail rabbits but relatively mild in the snowshoe variety; that grouse are more susceptible than the snowshoe rabbits; that wood-ticks are principally infected from the small rodents and not from the rabbits. The highest incidence of infection of wood-ticks he had found to be 0.25 per cent; the greatest hazard of infection of humans from the tick was found during May and June, and from animal contact during September and October.

On January 13, 1937, Dr. Thomas S. Roberts gave as his presidential address an interesting review of bird life in Minnesota. He was, of course, an authority on bird life and the author of the famous two-volume edition on Minnesota Birds.

The memorial to Dr. John T. Rogers[16] by Dr. Harold E. Hullsiek, read at the April 13, 1938 meeting, is a masterful account of a colorful career.

In conjunction with the first use of the sulfas, Dr. Moses Barron spoke on "Some Use of Sulfamidopyridine Preparations in the Treatment of Infectious Diseases" at the meeting of April 10, 1940, and noted that he had been favorably impressed by some of the results obtained. Dr. Zierold reported that the local use of sulfas had brought good results in compound fractures and had reduced infections from 30 to 1 per cent in patients at the Minneapolis General Hospital. Others reported good results from the use of sulfanilamide in intestinal operations on dogs.

From 1940 to 1950

On December 10, 1941, Dr. Max Hoffman and Dr. F. E. B. Foley presented a case of "Adrenogenital Syndrome Due to an Adrenocortical Tumor." Dr. Hoffman had been much interested in endocrinology and had established a laboratory with the assistance of public funds for the study of glandular secretions. Dr. Hoffman described a patient who had excessive hair on her torso as well as on her face and was losing the hair on her head. A tumor in her right flank was demonstrated by air injection and x-ray. Dr. Foley removed a large adrenal tumor with great difficulty, an operation which he recorded on color film. Following the surgical procedures, certain of the patient's masculine features disappeared and her normal hair distribution returned. (The case report was never published.)

On January 14, 1942, Dr. John Armstrong, in a paper on "Asiatic Cholera in Saint Paul," told how Asiatic cholera gained entry into this country in the mid-nineteenth century from Canada by way of Detroit, Michigan, and up the Mississippi River. In 1849, a Mr. L. B. Larpenter, aged seventy-one arrived in St. Paul by steamboat up the Mississippi River and died of cholera a few days later. A few more cases of cholera occurred in 1849 and 1850, and a small epidemic broke out in 1853 and 1854.

In the nineteen forties, the medical profession was much disturbed by the efforts being put forth in Congress to put medicine in the hands of the federal government. Each year a Wagner-Murray-Dingell bill was introduced in Congress, and at the January 12, 1944 meeting Dr. Harry B. Zimmermann gave his presidential address on the subject "Organized Medicine and the Wagner-Murray Bill." He emphasized the need for the medical profession to direct medical education through its established boards if state medicine should come, inasmuch as the medical profession alone knew the requirements for practitioners and specialists. He expressed the belief that state-controlled medicine was likely to come and that all the medical profession could do was to see that as little harm as possible was done to the practice of medicine.

At the January, 1947 meeting, Dr. Sam E. Sweitzer reported that he had found penicillin suitable in treating chronic as well as acute cases of syphilis, provided that its administration was preceded by bismuth and potassium iodide to prevent a Herxheimer reaction.

At the annual president's meeting held January 14, 1948, the living former presidents were guests of honor, and Dr. Ernest M. Hammes gave the presidential address on "The Drug Addict." Later that year in October, 1948, Dr. Wesley W. Spink spoke on his experience with the use of the new antibiotic Aureomycin® one of many antibiotics developed following the discovery of penicilin.

In November, 1950, Dr. Charles H. Slocumb of Rochester gave an unpublished paper on the use of cortisone and ACTH in rheumatoid arthritis. Since Dr. Edward C. Kendall of Rochester was the first to produce cortisone and since Dr. Philip Hench, also of the Mayo Clinic, was the first to use it clinically, the topic naturally had special interest locally.

I have carried my hasty review of the proceedings of the Academy through the year 1950. I beg the indulgence of the many members of the society — perhaps the majority — whose valuable contributions I have not been able to mention.

By and large, the suggestion made by the first president, Dr. John F. Fulton, that members have something to say when they address the Academy has been followed. The contributions have been largely reports of personal experiences and reviews of the pertinent literature, covering nearly all the specialties. Thus the members have been given an opportunity to broaden their medical knoweldge, an educational endeavor which, according to the first president of the Academy, is important even for a specialist.

The publication of the proceeding of the Academy, first in the *Northwestern Lancet,* then in the *Journal Lancet* and the *St. Paul Medical Journal,* and later in MINNESOTA MEDICINE has made the programs more widely available. Unfortunately, the proceedings of the Academy have not been published for the past four years, and I feel that every effort should be made to resume publication. It has been unfortunate to my mind, that some of the members through unjustifiable modesty or inexcusable lethargy have failed to turn in their presentations for recordings and publication. The Academy can be proud of its past, and it deserves the best efforts of its members to keep it in the vanguard of medical progress.

References

1. Hamilton, Arthur S.: An Historical survey of the Minnesota Academy of Medicine. J. Lancet, 45: 229, 1925.
2. O'Dwyer, Joseph P.: Intubation of the larynx. New York Med. J. 43:145, 1885.
3. Mayo, W. J.: A discussion of some features of periuterine and perityphlitic abscesses. N. W. Lancet, 10:166, 1890.
4. Fitz, Reginald H.: Perforating inflammation of the vermiform appendix with special reference to its early diagnosis and treatment. Trans. Assoc. Am. Phys., 1:107, 1886.
5. Balfour, Donald C.: The evaluation of the treatment of duodenal ulcer. Minnesota Med., 18:554, 1935.
6. Herrick, James B.: Clinical treatment of sudden obstruction of the coronary arteries. J.A.M.A., 59: 2015, 1912.
7. White, S. Marx: Importance of nonpainful features of coronary occlusion. Minnesota Med., 17:427, 1934.
8. Cross, J. G.: The present status of the x-ray in medicine and surgery. J. Lancet, 221:205, 1901.
9. Ramstedt, Wilhelm Conrad: Zur Operation der angeboren Pylorusstenose. Med. Klin., 8:1701, 1912.
10. Freeman, Charles D.: Recent advances and investigations of the treatment of syphilis with special reference to syphilis of the nervous system. St. Paul Med. J., 16:300, 1914.
11. Head, George Douglass: Tuberculosis (concealed): A hitherto unrecognized clinical type of tuberculous infection. Am. J. Med. Sci., 103:583, 1916.
12. Head, George Douglass: Concealed Tuberculosis or "The Tired Sickness." New York: Blakiston, 1924.
13. Richards, E. T. F., and Morris, R. Edwin: An electrocardiographic and clinical investigation of the therapeutic value of camphor. (Only discussions published). Minnesota Med., 5:192, 1922.
14. Nordland, Martin: Islet cell tumor of the pancreas. Minnesota Med., 20:609, 1946.
15. Ulrich, Henry L.: Some aspects of hypertension. J. Lancet, 46:543, 1926.
16. Greenhill, J. P.: The treatment of trichomonas vaginalis vaginitis. J.A.M.A., 96:1862, 1931.

Acute Necrosis of the Right Rectus Abdominis Muscle Simulating Acute Appendicitis

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ACUTE conditions involving the abdominal wall must be considered in the differential diagnosis of the acute abdomen. The following case report is presented.

Case Report

Mr. E. V., a white man aged thirty-three, was admitted to the Riverview Memorial Hospital on August 25, 1957. He complained of severe pain in the right lower abdomen which had begun six hours prior to admission to the hospital. The pain was constant and made worse by coughing.

He stated that he had a "soreness" in the same area for four to five days, also made worse by coughing or sneezing. There was no nausea or vomiting, and he had a normal bowel movement the morning of admission. There were no genito-urinary complaints. There was no history of any abdominal injury.

Past history revealed mild ulcer-like symptoms ten years previously which promptly disappeared after medical therapy with no recurrence. He had never had any abdominal surgery. He was employed as a truck driver.

The patient was a very well developed and heavily muscled man in acute distress. His oral temperature was 99.8° F. Blood pressure and pulse rate were normal. Positive physical findings were limited to the abdomen.

There was marked tenderness in an area three inches to the right and just below the level of the umbilicus. There was no discoloration of the skin of the abdominal wall. The abdomen was not distended, and no bowel sounds were heard on auscultation. Marked muscle guarding was present in the area of tenderness. Rebound tenderness was not present. There were no palpable masses in the abdomen. Digital rectal examination was negative, and there was brown stool in the rectum.

It was extremely difficult for the patient to sit up, since this movement accentuated the abdominal pain. No mass was felt during this maneuver.

Laboratory studies revealed a normal urinalysis and hemoglobin. The leukocyte count was 12,200, with 47 per cent neutrophiles, 49 per cent lymphocytes, and 4 per cent eosinophiles. The Kline serology test was negative. Roentgenograms of the chest and abdomen (including an upright position) were negative.

In evaluating this condition, it appeared that the marked abdominal tenderness, which was well localized, was out of proportion to the other findings. An acute surgical abdomen seemed certain, however, and the patient was taken to surgery for abdominal exploration.

Under general anesthesia, a 10 cm. right paramedian incision was made directly over the area of maximum tenderness. When the anterior rectus sheath was incised, approximately 2 ounces of thin, xanthochromic fluid gushed out of the rectus sheath, and a complete gap in the right rectus muscle was found. The defect measured about 6 cm. in length. There was no hematoma, and while the muscle edges above and below the defect were ragged, there was no bleeding from the muscle edges.

The muscle edges were debrided, and the peritoneum was not opened. A small split Penrose drain was placed at the bottom of the rectus muscle defect and brought out the lower end of the incision. The incision was closed in layers with interrupted silk sutures.

Convalescence was uneventful. The drain was removed on the fourth postoperative day and the patient discharged from the hospital the same day. He was last seen three months after surgery, at which time the operative site was as strong as the opposite side. He had resumed his heavy work two months after surgery with no ill effects.

Discussion

This case was diagnosed as necrosis of the rectus muscle since proof of rupture of the muscle or

hematoma in the muscle could not be proved. It is possible, of course, that rupture of the muscle did occur. However, the patient could not recall any sudden onset of pain after exertion which one would expect if this broad muscle had suddenly ruptured.

TABLE I. PHYSICAL FINDINGS[2]

Symptoms	Number Cases	Per Cent Total Cases
Pain	51	100
Localized tenderness	51	100
Elevated white blood counts	20	39
Gastro-intestinal symptoms	16	31
Elevated temperature	21	41
Upper respiratory infection	10	20
Grossly palpable hematoma	10	20

A brief review of the literature revealed a number of reports of this condition. The majority of the papers concerned single case reports. Two cases were reported in this journal by Eiler in 1956.[1]

Most of the cases were reported during World War II. Fruin and McLaughlin[2] reported fifty-one cases of rectus muscle strain occurring in trainees at a naval training station. Forty of the cases involved the right lower rectus muscle. The histories and clinical findings were very similar in that all patients had undergone violent exercise just prior to the onset of their symptoms. The authors presented Table I listing the essential physical findings.

They suggested procaine infiltration of that portion of the abdominal wall as a diagnostic test whenever rectus muscle strain, rupture, or hematoma is suspected.

Bowers and Richard[3] reported a similar experience from an Army training camp. They advocated conservative treatment with absolute bed rest, local heat, and oral medication for relief of pain.

Teske[4] stressed the occurrence of this condition in aged, debilitated patients with advanced arteriosclerosis. The inferior epigastric artery may be weakened and rupture after exertion such as lifting, coughing, or sneezing. He advocated exploration of the rectus sheath, evacuation of the hematoma, ligation of any bleeding vessels, debridement of non-viable muscle ends, and layer closure of the incision, with or without drainage.

Martin and Thompson[5] reviewed the literature and suggested a Zenker type degeneration of the muscle. These authors noted a number of cases of rectus muscle rupture during the pandemic of influenza in 1917-1918. Zenker's degeneration of striated muscle is said to accompany influenza.

Brödel[6] made an exhaustive detailed study of the anatomy of the rectus muscle. He pointed out several factors which might predispose hemorrhage in the lower portion of this muscle. This part of the muscle contracts a greater distance than the upper portion, due to lack of tendinous inscriptions. The inferior epigastric vessels lie deep to the muscle along the lower portion and hence are exposed to trauma during contraction of this portion of the muscle. Also, the posterior rectus sheath is lacking below the semicircular line of Douglas, and hemorrhage below this line may extend a greater distance as well as across the midline to the opposite side.

The extreme stretching and thinning of the rectus muscle during the latter stage of pregnancy would account for the cases of rectus rupture or hematoma which may occur during the last trimester of pregnancy.

Summary

A case of acute necrosis of the right lower rectus muscle has been presented. The diagnosis was made at the time of surgery, and debridement of the muscle edges with drainage of the rectus sheath was done. Recovery was prompt, and no postoperative hernia developed. The treatment of this condition may be non-surgical or surgical. The latter is recommended, especially where an acute abdominal disease cannot be ruled out.

A brief review of the literature has been presented. One must always be aware of this condition in the differential diagnosis of the acute abdomen.

References

1. Eiler, J.: Hematoma of the rectus abdominis muscle. Minnesota Med., 39:219, 1956.
2. Fruin, R. L., and McLaughlin, C. W., Jr.: Rectus muscle strains simulating acute intraperitoneal disease. U.S.N. Med. Bull., 42:172, 1944.
3. Bowers, W. F., and Richard, N. F.: Rectus muscle strain simulating acute appendicitis. Mil. Surg., 92: 645, 1943.
4. Teske, J. M.: Hematoma of the Rectus Abdominis Muscle. Am. J. Surg., 71:689, 1946.
5. Martin, J. D., Jr., and Thompson, E. B., III: Spontaneous hemorrhage into the rectus muscle: two case reports and a review of the literature. Am. J. Surg., 23:309, 1957.
6. Brödel, M.: Lesions of the rectus abdominis muscle simulating an acute intra-abdominal condition. I. Anatomy of the rectus muscle. Bull. Johns Hopkins Hosp., 61:295, 1937.

Anomalous Biliary Duct

A Case Report

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Fig. 1.

RECENT literature concerning biliary tract surgery has emphasized the frequency of bile duct anomalies[1] and the serious, often fatal, consequences of the failure to recognize them at the operating table.[2] A plea for careful dissection and identification of all structures at the hilus of the liver is found in most articles dealing with the technique of gall bladder surgery. A case is presented of a rare and potentially dangerous anomaly of the biliary ducts encountered at the time of cholecystectomy.

Case Report

J. W.,* a twenty-one-year-old white woman, during the fifth month of a recent pregnancy first noted episodes of post-prandial, right upper quadrant pain which radiated to the back beneath the right scapula. The episodes of cramping pain lasted from two hours to several days. She vomited on occasion but never noted jaundice, dark urine or acholic stools. There was a definite relation of the attacks to fatty food ingestion.

Physical examination revealed a markedly obese woman weighing 201 pounds with right upper quadrant tenderness. There were no other unusual findings.

The pain was controlled medically by a combination of phenobarbital and belladonna and she was placed on a strict low fat diet in the Outpatient Clinic. Two cholecystograms and a subsequent intravenous cholangiogram failed to visualize the gall bladder. The attacks, though less severe, persisted, and nine months after the initial episode, she was subjected to surgery. She weighed 156 pounds when admitted to the Castle Air Force Base Hospital.

Exploration revealed inflammatory adhesions between the gall bladder and the duodenum. There were multiple small stones palpable within the gall bladder. Dissection at the triangle of Calot showed the common duct to be slightly enlarged, the cystic artery to be normal, and an anomalous right hepatic duct. Suspicion was first aroused when the apparent junction of the cystic and common duct appeared larger than usual, and even larger than the cystic duct near the neck of the gall bladder (Fig. 1). Further dissection demonstrated the actual cystic duct to terminate in an anomalous bile duct which entered the common duct. Cholangiograms performed through a polyethylene catheter inserted in the cystic duct confirmed the presence of the anomalous right hepatic duct and revealed a normal right and left hepatic duct (Fig. 2). The anomalous duct drained a minor portion (estimated 5 to 10 per cent) of the liver parenchyma. The cystic duct was ligated at its junction with the anomalous right hepatic duct, and the gall bladder removed. A common duct exploration was then performed and no stones or stricture were found. A T-tube was inserted in the common bile duct.

Postoperatively, the patient had considerable bile drainage on the dressings for twenty-four hours, but her abdomen remained soft, no jaundice was noted, her temperature remained below 100° F., and on the third postoperative day she was taking oral feedings and there was no drainage from the wound.

A cholangiogram done seven days after surgery again revealed the anomaly (Fig. 3). The T-tube was clamped and removed two days later. She was discharged on the ninth postoperative day.

Since discharge the patient has been entirely well, is eating all foods, and has had no abdominal distress.

This paper was written by Captain Mueller when he was serving as a surgeon in the Armed Forces. At present Dr. Mueller is a Surgical Resident at Minneapolis General Hospital.

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Discussion

Failure to recognize the anomaly could have resulted in serious postoperative consequences. If the segment of liver drained by the accessory duct were large enough, a persistent biliary cutaneous fistula might have resulted following excessive hepatic drainage.

If the anomaly was not recognized until after the accessory duct had been mistakenly ligated at its junction with the common duct, an interesting circumstance arises. Should one attempt a primary anastomosis or ligate the anomalous duct proximally? Certainly, if this duct had been severed, its small size would almost doom to failure any first attempt at reconstruction of ductal continuity. Initially, ligation would be the best treatment. Serious consequence to ligation of an accessory duct of this size is not anticipated.* However, recent case reports from Johns Hopkins University[3] cite two examples of mild jaundice in patients with occlusion of the left hepatic duct by a calculus. Obstruction of a single hepatic duct due to postoperative stricture has also led to a low-grade jaundice in the experience of the Lahey Clinic.[4] No doubt, in this case, the liver would clear the blood of retained bilirubin from a minor segment as demonstrated by the cholangiogram. Should drainage of this segment become imparative at a later date, a second procedure would technically be more satisfactory. The ligated duct would be significantly dilated at this time and anastomosis of it to the common duct or bowel could be accomplished with less difficulty and greater assurance of continued patency.

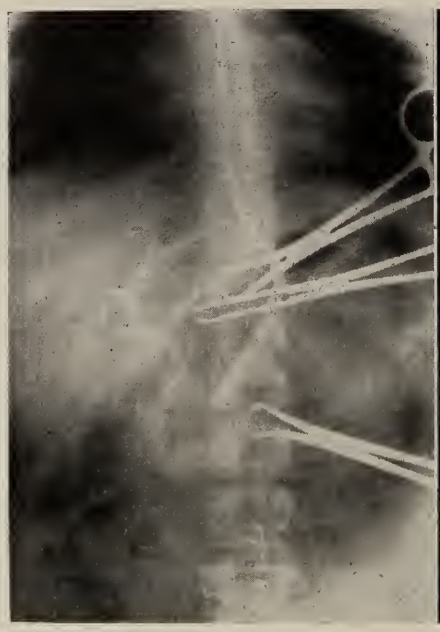


Fig. 2.

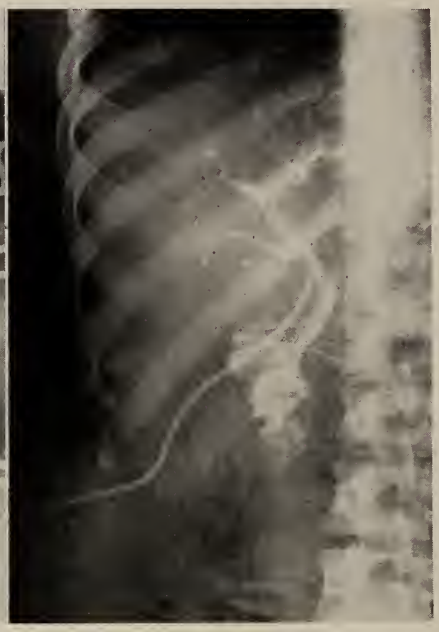


Fig. 3.

Conclusion

The biliary duct anomaly encountered in this case, namely an accessory right hepatic duct from which the cystic duct arises, is a rare bile duct variation. It is not recorded in texts on the subject and recent surveys. The occurrence of unusual variations in the extra-hepatic ductal system serves to emphasize the need for careful dissection and positive identification of all structures, both vascular and ductal, at the hilus of the liver before any single structure is ligated.

*Drs. Richard Cattell and John W. Braasch of the Lahey Clinic, who reviewed the case, concurred in these opinions.

Bibliography

1. Braasch, John W.: Congenital anomalies of the gall bladder and bile ducts. S. Clinics N. Am., 38:627, 1958.
2. Cattell, Richard B., and Braasch, John W.: Strictures of the bile ducts. S. Clinics N. Am., 38:645, 1958.
3. Stafford, Edward S., and Isaacs, James P.: Stone in the left hepatic duct causing jaundice. Ann. Surg., 147:812, 1958.
4. Braasch, John W.: Personal Communication. Aug., 1958.

Editorials

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THE PREDICTION OF WEIGHT LOSS ON A REDUCING DIET

Patients on reducing regimens frequently ask, "How fast will I lose on this diet?" It is often helpful to be able to make some estimate of the probable rate of loss, since many patients have exaggerated concepts of the rates of loss possible. It is important, however, to understand the variables involved in making such a prediction and to realize that only limited accuracy is possible.

In essence, any such prediction depends on knowledge of three factors, namely (1) the actual caloric intake, (2) the caloric expenditure and (3) the caloric value of the tissue lost during reduction. If these three factors are known, the rate at which weight is lost can be computed by simple arithmetic. The problem comes in knowing what values to assign to these three factors.

Caloric Intake

The caloric intake depends on the accuracy of measurement of the diet and the constancy of composition of foods. Even under the best of circumstances, there is probably an error of plus or minus 10 per cent in estimating caloric intake. This means that, even with the very best effort on the part of everyone concerned, the prescribing of a 1000-calorie diet may mean an actual consumption of something between 900 and 1100 calories. This does not consider the occasional excesses of food that must be expected of even the most conscientious dieter.

Caloric Expenditure

The caloric expenditure varies widely. Factors of age, sex, weight, height and activity and possibly the imposition of the diet itself all influence caloric expenditure. Of these, perhaps activity is the hardest to estimate. Some obese persons are exceedingly inactive, whereas others expend a great deal of energy in their work and in just getting about. In general, however, predictions that assume relative inactivity will prove most nearly correct. There is also the variable of the difference between the specific dynamic action of a maintenance diet and that of a reducing diet, although this should be rather small. This tends to decrease caloric expenditure as the individual begins the reducing diet and is an additional reason for making a relatively small allowance for activity in the computations to be described.

Caloric Value of Tissue Lost

The third factor, the caloric value of tissue lost during weight reduction, is difficult to estimate and apparently will vary somewhat with the duration of time from initiation of the reducing diet. It is a common observation by the dieting public that the first few pounds are lost easily and quickly but that sustained weight loss is slower and hence more discouraging.

Dole and associates[1] used the term "labile tissue" to describe that tissue lost during the first few days of a low-calorie diet. They stated that wet glycogen has a value of 1.72 calories per gram (cal./gm.) and "labile tissue protein" has a value of only 0.8 cal./gm. These figures are to be contrasted with the usually given values of 9.3 cal./gm. for fat and 4.0 cal./gm. for protein or carbohydrate. The initial rapid loss of weight on a reducing regimen is thought to be associated with decreases in body water, glycogen and labile protein, while later losses represent a greater proportion of adipose tissue.

The initial dehydration and rapid weight loss appear to be the result of the change from a mixed diet with a metabolic mixture derived mostly from carbohydrate to a metabolic mixture derived largely from endogenous fat. This idea is supported by observations of Holt[2] in infants and by calorimetric studies of Benedict and Milner.[3] Passmore and coworkers[4] suggested that the body may require 2 to 4 liters more of body water when metabolizing mostly carbohydrate than it does in metabolizing fat. This water might be partly extracellular fluid and partly fluid bound to glycogen and labile protein; the latter portion, therefore, might not be measured by dilution techniques.

Kekwick and Pawan[5] studied obese patients receiving diets composed in turn of 90 per cent fat, 90 per cent carbohydrate and 90 per cent protein for periods of five to nine days. The most rapid weight loss was found on the high-fat diet, and the

least occurred on the high-carbohydrate diet. While it is possible that the high-fat diet increased caloric expenditure, the differences in weight loss could well be the result of the factors already mentioned.

TABLE I. CALORIC VALUE OF "OBESITY TISSUE," AND FACTOR TO PREDICT WEIGHT LOSS

Authors	Source of Value	Cal./kg. of "Obesity Tissue"	Factor (Factor × Daily Caloric Deficit = Pounds Lost Per Week)
Strang and Evans[9]	Assumption that adipose tissue is 87 per cent fat and that weight accumulation is all adipose tissue	8091	0.0019
Wilder[7]	Assumption that adipose tissue is 86 per cent fat and that weight accumulation is all adipose tissue	7998	0.00193
Passmore et al.[4]	Observations on reducing patients, with careful estimates of caloric expenditure	7000-8100 (average of 7400)	0.0021
Keys et al.[6]	Forced feeding and weight gain in normal men	6180	0.0025
Taylor et al.[10]	Observations during first few days of starvation of normal men	2060-2598	0.0074-0.0064
Dole et al.[1]	Four-day periods of subcaloric diet alternating with four-day periods of generous diet	2510	0.0061

Other factors may influence hydration and thus cause variations in body weight from time to time. Emotional stress has been said to increase the retention of water, and release of such stress may result in diuresis and weight loss;[4] observations have not been extensive enough to say that such a relationship is constant, however. Rest in bed increases diuresis, and the additional possibility of retention of water on the basis of "starvation edema" during weight reduction is to be considered.

Thus, if the patient continues regularly on a diet, matters are complex enough, but if he eats an occasional carbohydrate meal in addition to his prescribed diet, he may temporarily accumulate an increment of "labile tissue" that causes a transient increase in weight out of proportion to the actual caloric value of the meal.

Despite the complexities of this problem, it is possible to make a clinically useful approximation of the over-all caloric value of tissue lost during weight reduction. Keys and associates[6] have clarified the problem by introducing the term of "obesity tissue" and defining it as the material laid down in response to excessive caloric intake; they regarded it as composed of fat, protein, other cellular solids and water, and not as simple adipose tissue alone. It is suggested that the muscle mass may increase in response to the increased load of moving a heavier body, and extracellular water (expressed in absolute terms rather than as percentage of body weight) has been shown to increase in developing obesity. Keys and co-workers estimated on the basis of feeding experiments that obesity tissue is composed of 13 to 15 per cent extracellular water, 0 to 1 per cent glycogen and 61 to 64 per cent fat, with the balance as "cells."

Wilder[7] used data from Bozenraad, who found that adipose tissue contained 15 per cent water by weight, assumed the balance was all fat, used a factor of 9.3 cal./gm. (the heat of combustion of fat) and derived a formula for predicting weight loss. Keys and Brozek[8] pointed out that computations for predicting weight loss based on Bozenraad's data assume that the difference between a thin man and a fat man is only in the amount of adipose tissue and ignore the possibility that muscle and extracellular fluid may increase with a gain in weight. The formula also assumes that adipose tissue is 85 per cent fat, the remainder being water. Keys and Brozek questioned whether such an assumption is justified, since Bozenraad's figures showed that adipose tissue contained an average of 15 per cent water but did not give a direct analysis of the fat.

Some of the estimates of the caloric value of obesity tissue are given in the accompanying table. It is notable that the two estimates giving a relatively low caloric value are for brief periods at the beginning of caloric restriction and would correspond to "labile tissue." The agreement between the first four values is surprisingly good, perhaps good enough to permit some prediction of the probable rate of weight loss. The error in estimating probable caloric expenditure is likely to be appreciably greater than the minor differences between the several values given for the caloric content of obesity tissue.

How to Predict Loss of Weight

The caloric expenditure can be estimated by means of the Boothby-Berkson nomogram,[11] using the measured height and a weight about 20 pounds less than that at the beginning of the period of observation. This smaller weight is chosen because

it should reflect more accurately the weight of the patient during the period of weight loss than would the initial weight, although the difference in the final results using the two different weights is relatively small. An increment of 30 per cent of the basal requirements usually is added to provide for ordinary activity, but a smaller or larger value should be substituted if activity is greatly different from average light housework or desk work. The difference between the caloric expenditure and the caloric content of the diet prescribed multiplied by the factor 0.002 will then yield the prediction of pounds per week likely to be lost. It is emphasized that this prediction is subject to many variables and should be regarded as only a gross approximation. If considered in this manner, this factor may be a clinically useful figure.

References

1. Dole, V. P., Schwartz, I. L., Thorn, N. A., and Silver, Lawrence: The caloric value of labile body tissue in obese subjects. J. Clin. Invest., 34:590, 1955.
2. Holt, L. E., Jr.: Dietary fat—its role in nutrition and human requirement. J.A.M.A., 164:1890, 1957.
3. Benedict, F. G., and Milner, R. D.: Experiments on metabolism of matter and energy in human body. Bull. U. S. Dept. of Agriculture, Office Exper. Sta., 175:226, 1907.
4. Passmore, R., Strong, J. A., and Ritchie, Fiona J.: The chemical composition of the tissue lost by obese patients on a reducing regimen. Brit. J. Nutrition, 12:113, 1958.
5. Kekwick, A., and Pawan, L. S.: Metabolic study in human obesity with low caloric diets high in fat, protein or carbohydrate. Metabolism, 6:447, 1957.
6. Keys, Ancel, Anderson, J. T., and Brozek, Josef: Weight gain from simple overeating. I. Character of the tissue gained. Metabolism, 4:427, 1955.
7. Wilder, R. M.: The treatment of obesity. Internat. Clin., 4:1, 1933.
8. Keys, Ancel, and Brozek, Josef: Body fat in adult man. Physiol. Rev., 33:245, 1953.
9. Strang, J. M., and Evans, F. A.: Energy exchange in obesity. J. Clin. Invest., 6:277, 1928.
10. Taylor, H. L., Henschel, Austin, Mickelson, Olaf, and Keys, Ancel: Some effects of acute starvation with hard work on body weight, body fluids and metabolism. J. Appl. Physiol., 6:613, 1954.
11. The Committee on Dietetics of the Mayo Clinic: Mayo Clinic Diet Manual. ed. 2. Philadelphia: W. B. Saunders Company, 245 pp., 1954.

CLIFFORD F. GASTINEAU, M.D.

ON GROWING OLD

Almost everyone has heard Maurice Chevalier sing in Gigi, "I'm glad I'm not young anymore." I can echo that sentiment. We have learned that, with all its joys, youth has its deep sorrows too, without the years of experience to temper them. When one gets old, both joys and sorrows are weighed relatively, thereby missing the depths and not quite scaling the heights but reaching acceptance and sometimes serenity.

When my father was eighty, he said one day, "My girl, it seems just yesterday I was planning my life, and now it is almost over and the past is like a dream." I know what he was talking about, although I didn't at the time. If we have lived fully while growing old, age itself has few terrors. The one which is on the border of consciousness is that of chronic or disabling illness. Since that is out of one's control, the farther back it can be kept the better.

A small percentage of people have no interests outside themselves. As their world contracts with a family gone, a job over with, friends dying, their plight is sad. More and more communities are providing some public leisure time activities hoping that through advertising, through word of mouth, or even through desperation, the people who now need to make new friends will utilize the opportunities presented.

Dr. Walter Gardner has said that in old age you are just what you were when young—only more so. If activities through PTA, through business associations, through clubs, or most of all through volunteer work in civic or social agencies have been part of your life, then the later years are bound to be fuller than you could anticipate.

I have had a wonderful life. I was able to carry my professional experience into volunteer work at once. My husband was proud to have me able to be of service. My children probably thought I went to too many meetings. But now, when I am alone they, too, are proud that I have so much to do. I have no time to look backward regretfully, but can look forward to the next meeting, the next project, or the next assignment with anticipation.

Many people have had happy church connections sometimes on the receiving end rather than the giving. The later years give time to be available for the duties someone has to do. There are envelopes to stuff, food to prepare, bazaars to man, telephoning to be completed. Some churches are setting up clubs for older people to which the community is invited, not just the congregation. A member of the congregation could help start such a group if she felt dedicated enough. Otherwise another dedicated one has to search out the re-

tiring one and try to make her future outlook happier by a closer renewed interest in her church.

I like some fields of art. There are endless opportunities if your community has an art institute or art school. Each one will have different projects but willing hands are always needed. This is equally true of little theatres, or science museums, or historical societies, who need work done and seldom have money enough to hire all the services which are needed. If you have a deep interest and are otherwise qualified you are apt to find yourself a board member which carries a great reward for work done.

Bridge, canasta, or other card games are such sociable activities they can't help but make a day seem brighter. If you can serve coffee and a doughnut, it becomes a party. In one room or ten the hospitality can be offered. It can be offered without the game. In our neighborhood, we often have a delightful coffee klatche, and it's the conversation we enjoy—just getting together.

In low moments which come to us all, we can't forget the joy found in walking, with due concern for the slippery weeks in our lovely state. A good brisk walk, alert to the sky, the branches of trees, later the leaves, give one rising spirits and comfortable nights.

No age is without its trials, each decade has its special joys. This is just as true of the sixth decade as it was of the first. More and more of us are living longer and longer in this terrifying but magnificent age. We are fortunate to be part of it, and owe it our service.

Althea Atwater, *Chairman*
Governor's Citizen's Council on Aging

IONIZING RADIATION HAZARDS

A Perspective

The recent report to the surgeon general of the U. S. Public Health Service prepared by the National Advisory Committee on Radiation concludes that the cost of an adequate radiation control program by the Federal Government "will reach a level of approximately fifty million dollars in a period of five years." Perhaps no other single statement so aptly portrays the growing concern by responsible medical and public health officials regarding the rapid increases of the population's exposure to all forms of ionizing radiation.

Fallout from nuclear weapons testing has been the subject of much public controversy, and indeed there is sufficient evidence for justifiable serious concern over this problem. Nonetheless, viewing the lifetime exposure of the whole body for the general population from all sources of ionizing radiation, most estimates are in the range of about 30 per cent from natural background, less than 5 per cent from fallout, and about 65 per cent as a result of the health professions' use of x-rays. The steady increase in the use of x-ray is shown by the following table of the annual whole body dose of radiation received by an average individual of the United States from x-ray sources. This upward trend is expected to continue.

Year	*Dose in Millirems*
1925	15
1935	40
1945	75
1955	135

Other major sources of exposure to ionizing radiation created or developed by man include nuclear reactors, their radioisotopic by-products, concentrated naturally occurring radioactive materials, and high energy particle accelerators. It is currently estimated that in 1965 there will have accumulated 1,500,000 gallons of high and intermediate level radioactive waste products from nuclear power development, and that by 1995 this volume will be 2,900,000,000 gallons. To what extent these wastes will add to the increasing burden of exposure to the general population is unknown. At the moment, it can be fairly stated that safe and adequate disposal methods for these quantities of wastes are not available.

The present use of radioisotopes in medicine, research, and industry is visualized as only at the threshold of probable development. The growth of the use of these materials is demonstrated by the annual shipment records for radioisotopes from the Oak Ridge National Laboratories as follows:

Year	*Curies shipped*
1952	12,000
1954	30,000
1956	100,000
1958	230,000

While this growth, in itself disturbing, in the use of devices and materials which produce ionizing

radiation has been gaining momentum, the maximum permissible levels of exposure to ionizing radiations as established by the National Committee on Radiation Protection and other authoritative groups have been successively and drastically revised downward during the last thirty years. The maximum permissible annual dose for workers occupationally exposed to ionizing radiation has been reduced, in the last year, from 15 rem to 5 rem, and the equivalent permissible dose during the period of 1931 to 1936 was 60 rem.

It is evident that serious health hazards can be anticipated unless strong and aggressive safeguards and controls are developed and applied to limit undue radiation exposure by every practical means, not only for the population at large, but also individual by individual. Any and all exposure, in final analysis, is undesirable. Practically, the ideal of no exposure from any source is unattainable. Further increases of exposure levels are undoubtedly inevitable, if advances in technology and science are to continue. The decision of just what constitutes an acceptable sacrifice of the public health for the potential human benefits to be derived in the nuclear age will eventually have to be faced.

F. L. Woodward
Minnesota Department of Health

MEDICAL PRACTICE PLANNED BY STUDENTS

The type of practice planned by senior medical students is affected by marital status to a larger extent for males than for females. Specialty practice is planned by almost three-quarters of the single men; by about two-thirds of the married men with no children, and by little more than half of the married men who had children. This decrease by marital status in the proportion of men choosing specialty practice is accompanied by an increase in each category respectively, in the proportion of men favoring general practice.

Marital status seems to be a less important factor with female than male students in choosing the type of practice. It is interesting to note that specialty practice is preferred by a somewhat larger proportion of women with children than by women who had no children.

Association of American Medical Colleges

CUTANEOUS REACTIONS TO COSMETICS AND RELATED SUBSTANCES

(Continued from Page 218)

References

1. Sataloff, J., and Wilson, J. F.: Perforated ear drum following home permanent wave. J.A.M.A., 147: 1135, 1951.
2. Howell, J. B.: Contact dermatitis from hair lacquer. J.A.M.A., 123:408, 1943.
3. Schwartz, L. (cited by Bowen, R.): Hair lacquer dermatitis. Ann. Allergy, 1:162, 1943.
4. Thomas, E. W. P.: The medical aspects of hair-dyeing. Practitioner, 165:171, 1950.
5. Grover, R. W.: Diffuse hair loss associated with selenium (Selsun) sulfides shampoo. J.A.M.A., 160: 1397, 1956.
6. Sutton, R. L.: Diseases of the Skin. p. 155. St. Louis, Missouri: C. V. Mosby Co., 1956.
7. Kline, P. R., and Baer, R. L.: Nature of inhibition of ultraviolet erythema by pyribenzamine. J. Invest. Dermat., 10:397, 1948.
8. Cahn, M. M., Levy, E. J., and Shaffer, B.: Use of chloroquin diphosphate (Aralen) and quinicrine (Atabrine) hydrochloride in prevention of polymorphous light eruptions. J. Invest. Dermat., 22:93, 1954.
9. Daniels, F., Hopkins, C. E., and Fitzpatrick, T. B.: Effects of oral methoxsalen (8-Methoxypsolarlen) on sunburn and suntain. A.M.A. Arch. Dermat., 77:503, 1958.
10. Arnold, H. L., Jr.: Psoralens and sun-tan: Augmentation of skin responses to sunlight by psoralen derivatives. Hawaii M. J., 16:391, 1957.

HOW TO WRECK A MEETING

"How to Wreck a Meeting" is the title of a tongue-in-cheek article which recently appeared in the American Management Association's publication, *The Management Review.*

The article offers the following advice on how *not* to use a meeting to good advantage:

To the Chairman: (1) Call the meeting without notice. (2) If you have compiled 10 pages of advance information that was sent to everyone, read it aloud and explain the footnotes. (3) Squelch any new approach not outlined in the agenda. (4) Let Sam and Joe debate their personal differences for the length of the meeting, thus providing good clean entertainment for all. (5) Or, insist that Sam and Joe are really in agreement, and prove it by misquoting them. This will unite them in an attack on you. (6) Change the decisions reached at the meeting—but don't let others know (it might hurt their feelings).

To the Participants: (1) Let the chairman do all the work. It's his meeting. (2) Defend yourself! Anyone who openly disagrees with your viewpoint probably has it in for you. (3) Take careful notes on everything, including date, time, temperature and barometer reading. If you don't catch every word that's said, ask for a recap. (4) Don't listen to others; they will only confuse you. Use the time while they're talking to think up your next remarks. (5) Side with the majority, regardless of your real opinion.

President's Letter

DOCTOR IS OUT

"He is attending the 107th Annual Meeting of the Minnesota State Medical Association, where he is hearing lectures by the leading scientists of the nation and viewing the latest medical and surgical techniques and equipment that he may better serve your medical needs."

This message posted in your office May 23, 24 and 25, will inform your patients that your brief absence to attend the Annual Meeting of our State Association is in their best interest.

To you, as members, we extend a cordial invitation as well as a gentle exhortation to attend all scientific sessions in the Mayo Civic Auditorium. We remind you also of the important contributions which our technical exhibitors annually make toward the over-all success of the meeting.

The opening session of the House of Delegates will convene Sunday, May 22, at 2:00 p.m.

An entire day of Symposiums on Rheumatic Heart Disease and Diseases of the Lung is scheduled for Monday the opening day of general scientific sessions. Other program highlights for Monday include a lecture on Space Medicine by A. H. Schwichtenberg, M.D., Albuquerque, New Mexico; and the Arthur H. Sanford Lecture in Clinical Pathology to be given by Tague C. Chisholm, M.D., Minneapolis. "The Acutely Burned Child" will be the topic of Doctor Chisholm's address. The final scientific session scheduled for Monday will feature a Clinical-Pathological Conference on Diseases of the Chest.

Scientific sessions on Tuesday will be devoted to cancer. A Symposium on Cancer Detection for Practicing Physicians has been set for 9:00 a.m.

Joseph H. Ogura, M.D., St. Louis, Missouri, will give the Minnesota Academy of Ophthalmology and Otolaryngology Lecture on "Cancer of the Throat" at 11:00 a.m.

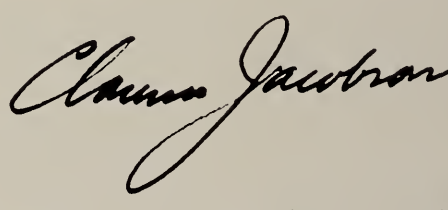
"The Meaning of Curative and Palliative Radiation Therapy" will be discussed by Walter T. Murphy, M.D., Buffalo, New York. Also included in the Tuesday series of presentations on cancer will be two Symposiums on Cancer Treatment and Management of the Far-advanced Cancer Patient.

The Wednesday morning session will be a novelty. It will be devoted entirely to a series of six dry clinics by Mayo Clinic staff members on pertinent topics, all at the Auditorium.

All physicians and their wives are invited to be guests of the Zumbro Valley Medical Society, Monday, May 23, at 9:00 p.m., at the Mayo Civic Auditorium for the annual open house.

We have been fortunate in securing as our annual banquet speaker, Dr. Laurence Gould, President of Carleton College in Northfield. "Education for a World of Change" will be the title of Dr. Gould's address.

You will like to attend the meeting in Rochester because the program is first class, housing accommodations are excellent, parking facilities are good, the exhibits and meetings will be held in a modern setting, and Minnesota physician fellowship will be at its best. Check the Preliminary Program in this issue of MINNESOTA MEDICINE, as well as the Official Program which you will receive, for full program details.



President, *Minnesota State Medical Association*

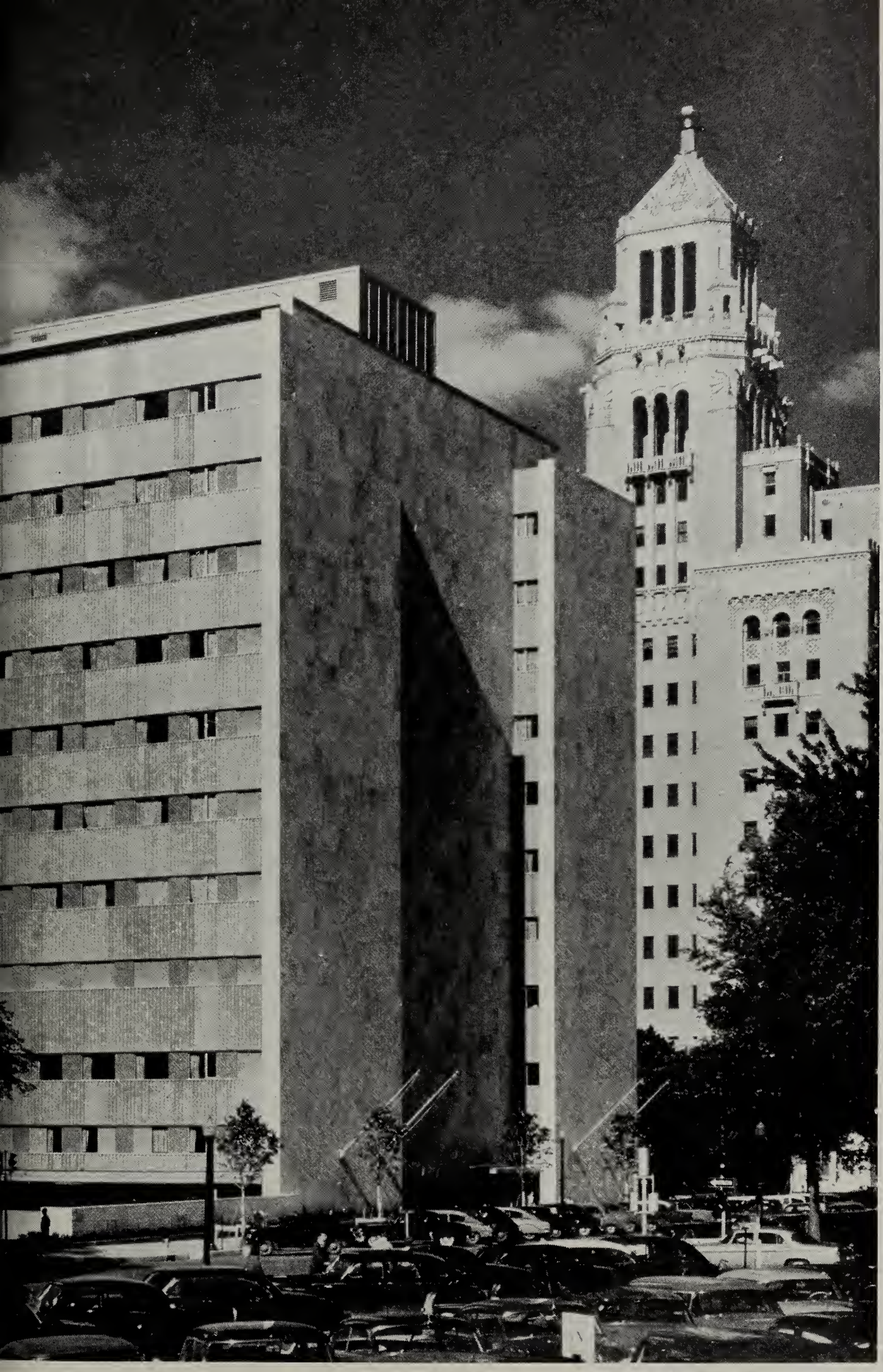


Photo courtesy of Mayo Clinic

The 107th Annual Meeting May 23, 24, 25, 1960

Rochester Welcomes . . .

The Minnesota State Medical Association

WATERS
ELECTRO-MEDICAL
INSTRUMENTS

DENSITOMETERS
For indicating dye dilution curves in cardiovascular function studies.

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Convention City

Rochester, a city rich in history, was settled in the early 1850's by men who recognized its potential as an agricultural center. After the turn of the century, fate made it a world center of medicine. Today it is a bustling city of many pursuits.

Rochester, county seat of Olmstead County, is situated in the heart of southern Minnesota's rich agricultural and dairying section, approximately 75 air miles southeast of Minneapolis and St. Paul.

Rochester was founded in 1854 as a crossroads campground for wagon trains that were pouring into Minnesota. From a population of less than 50 in 1856, it has grown to become a city of 36,000 residents, with a transient population annually of 350,000.

Rochester is a fascinating combination of industry, commerce, fine homes and cultural institutions in the midst of an agricultural region.

Friendly Rochester combines the intimate congeniality of a small city with the advantages of a metropolitan center. Its services attract hundreds of thousands of people from nations around the globe. The result is a cosmopolitan atmosphere and activities ordinarily found only in much larger cities.

Some industry Rochester has developed because of its medical aspects and some because of its location in an agricultural area. Large dairy concerns are situated here. Other industries related to agriculture operate in the community. With the decision of International Business Machines corporation to establish a large and important phase of its operation on a 397-acre plot at the city's edge a new horizon of industry was opened for Rochester. Thus it becomes a community dedicated to alleviating both man's ills and his toils.



BEST WISHES

FROM

INTERNATIONAL BUSINESS MACHINES CORPORATION

Rochester, Minnesota

Minnesota State Medical Association

107th Annual Meeting

Rochester, Minnesota—May 23-25, 1960

Preliminary Program

BUSINESS SESSIONS

Kahler Hotel

SATURDAY, MAY 21

2:00 P.M.—Council — University Club Lounge
6:00 P.M.—Council Dinner — University Club Lounge
8:00 P.M.—Council — University Club Lounge

SUNDAY, MAY 22

8:00 A.M.—Council — University Club Lounge
2:00 P.M.—House of Delegates — Royal Coach Room
6:00 P.M.—New Members and County Officers Dinner — Elizabethan Room
8:00 P.M.—House of Delegates — Royal Coach Room

MONDAY, MAY 23

8:00 A.M.—Council — University Club Lounge
12:15 P.M.—House of Delegates — Royal Coach Room

TUESDAY, MAY 24

8:00 A.M.—Council — University Club Lounge

WEDNESDAY, MAY 25

8:00 A.M.—Council — University Club Lounge

SPORTS EVENTS AND OUTINGS

SUNDAY, MAY 22

GOLF TOURNAMENT

Place: Rochester Golf and Country Club

Tee-off Time: 10:00 A.M.-12:00 noon—Sunday

Cocktails and Buffet: 5:00 P.M., golfers and wives—$2.65 per plate.

Prizes will be awarded to the low scorers. Green fees—$5.00. Make reservations individually or with your partner, indicating preferred tee-off time.

SKEET AND TRAP EVENTS

Place: Rochester Gun Club

Time: 1:00 P.M.-4:00 P.M.—Sunday

The Club is located ¼ mile west of St. Mary's Hospital on Highway 14 behind the golf driving range on the north side of the highway. Driveway entrance is behind State Highway Department offices.

Events will include regular skeet and trap rounds of 25 shots in each round.

Prizes will be awarded at the Sports Events Smorgasbord at the Rochester Golf and Country Club.

SPECIAL EVENTS

SUNDAY, MAY 22

Sports Event Smorgasbord

5:00 p.m. Rochester Country Club. All guests at at the Annual Meeting are cordially invited to attend with sports participants and their wives

Dinner

New Members and County Officers Dinner
6:00 p.m. Elizabethan Room, Kahler Hotel

MONDAY, MAY 23

Minnesota Society of Clinical Pathologists

The Society is host at this meeting to the North Central Region of the College of American Pathologists (including Wisconsin, Iowa, North and South Dakota, and Illinois).

9 a.m.-11 a.m. and 2 p.m.-5 p.m. Annual Seminar, Judd Hall, Clinic Building

11:30 a.m. Arthur H. Sanford Lectureship in Pathology

12:15 p.m. Luncheon, Town House Restaurant

6:30 p.m. Dinner, Centennial Room, Kahler Hotel

Minnesota Chapter, American Academy of Pediatrics
12:15 p.m. Luncheon Meeting, Michael's Supper Club, 15 South Broadway

Minnesota Academy of General Practice
6:00 p.m. Elizabethan Room, Kahler Hotel. Tickets are $6.00, gratuity included
Speaker: Countess Maria Pulaski

Open House

Minnesota State Medical Association
9:00 p.m. Mayo Civic Auditorium Theater. All physicians and their wives are invited to attend OPEN HOUSE, including an entertaining variety show, as guests of the Zumbro Valley Medical Society

TUESDAY, MAY 24

Luncheon

Minnesota Academy of Ophthalmology and Otolaryngology
12:00 noon Kahler Hotel
Speakers: Joseph H. Ogura, St. Louis, Missouri, and Harold O. Perry, Rochester.
Discussion: Thomas J. Kirby, Rochester

Dinners

Minnesota Radiological Society
6:00 p.m. Kahler Hotel
Speaker: Walter T. Murphy, Buffalo, New York. "Complications of Head and Neck Irradiation"

Minnesota State Medical Association
7:00 p.m. Annual Banquet, Elizabethan Room, Kahler Hotel. Tickets are $6.00, gratuity included

ROUND TABLE LUNCHEONS

Kahler Hotel—12:15 P.M.

MONDAY, MAY 23

Office Gynecology—Complete Gynecologic Examination
FREDERICK J. HOFMEISTER, Milwaukee, Wisconsin

Evaluation of New Drugs for Diabetics
FREDERICK C. GOETZ, Minneapolis

Accreditation of Small Hospitals
KENNETH B. BABCOCK, Chicago, Illinois

TUESDAY, MAY 24

Obstetrical Emergencies
ANTHONY J. RUPPERSBERG, JR., Columbus, Ohio

Psychotherapeutic Drugs
BURTRUM C. SCHIELE, Minneapolis
WILBUR M. BENSON, Minneapolis

Impartial Medical Testimony
HARVEY NELSON, Minneapolis

GENERAL SESSION

Mayo Civic Auditorium

MONDAY, MAY 23

Morning Session

Chairman: R. S. YLVISAKER

A.M.
8:30 Visit Scientific and Technical Exhibits

9:00 SYMPOSIUM ON RHEUMATIC HEART DISEASE

Sponsored by the Minnesota Heart Association

Moderator, W. H. WEIDMAN, Rochester

Prevalence of Rheumatic Fever in Minnesota
WAYNE E. MATHY, Chicago, Illinois

Treatment of Acute Rheumatic Fever
CHARLES H. RAMMELKAMP, JR., Cleveland, Ohio

Abnormal Host Response to Streptococcal Invasion
ROBERT A. GOOD, Minneapolis

Prophylaxis of Recurrent Rheumatic Fever
W. H. WEIDMAN, Rochester

Question and Answer period

10:15 INTERMISSION
Visit Scientific and Technical Exhibits

11:00 LECTURE ON SPACE MEDICINE
A. H. SCHWICHTENBERG, Albuquerque, New Mexico

11:30 ARTHUR H. SANFORD LECTURE IN CLINICAL PATHOLOGY
The Acutely Burned Child
TAGUE C. CHISHOLM, Minneapolis

Afternoon Session

Chairman: ARTHUR M. OLSEN

P.M.
12:15 ROUND TABLE LUNCHEONS

1:30 Visit Scientific and Technical Exhibits

2:00 SYMPOSIUM ON DISEASES OF THE LUNG

Chairman: ARTHUR M. OLSEN, Rochester

Virus Pneumonias
WILLIAM R. FIFER, Minneapolis

Emphysema
HOWARD S. VAN ORDSTRAND, Cleveland, Ohio

Some Fundamentals of Chest Roentgenology
BENJAMIN FELSON, Cincinnati, Ohio

3:15 INTERMISSION
Visit Scientific and Technical Exhibits

4:00 CLINICAL-PATHOLOGICAL CONFERENCE ON DISEASES OF THE CHEST

Moderator, HERBERT W. SCHMIDT, Rochester

Panelists, O. T. CLAGETT, Rochester
BENJAMIN FELSON, Cincinnati, Ohio
WILLIAM R. FIFER, Minneapolis
HOWARD S. VAN ORDSTRAND, Cleveland, Ohio
L. B. WOOLNER, Rochester

GENERAL SESSION

Mayo Civic Auditorium

TUESDAY, MAY 24

Morning Session

Chairman: C. R. TIFFT

A.M.
8:30 Visit Scientific and Technical Exhibits

9:00 SYMPOSIUM ON CANCER DETECTION FOR PRACTICING PHYSICIANS

Moderator, A. O. SWENSON, Duluth

Tissue Diagnosis in Uterine Cancer
BEN M. PECKHAM, Madison, Wisconsin

Cytology in Cancer Detection
EDWARD H. SOULE, Rochester

Genito-Urinary Cancer
C. D. CREEVY, Minneapolis

The Diagnosis of Gastro-Intestinal Cancer
CLIFFORD J. BARBORKA, Chicago

10:15 INTERMISSION
Visit Scientific and Technical Exhibits

11:00 MINNESOTA ACADEMY OF OPTHALMOLOGY AND OTOLARYNGOLOGY LECTURE

Cancer of the Throat
JOSEPH H. OGURA, St. Louis, Missouri

11:30 RUSSELL D. CARMAN MEMORIAL LECTURE
The Meaning of Curative and Palliative Radiation Therapy
WALTER T. MURPHY, Buffalo, New York

Afternoon Session

Chairman: Frederick M. Owens, Jr.

P.M.

12:15 ROUND TABLE LUNCHEONS

1:30 Visit Scientific and Technical Exhibits

2:00 SYMPOSIUM ON CANCER TREATMENT
Moderator, Charles M. Blackburn, Rochester
Surgical Aspects
William J. Grove, Chicago, Illinois
Chemotherapy
George C. Escher, New York City
Radiation Therapy
Walter T. Murphy, Buffalo, New York

3:15 INTERMISSION
Visit Scientific and Technical Exhibits

4:00 MANAGEMENT OF THE FAR-ADVANCED CANCER PATIENT
Moderator, William J. Grove, Chicago, Illinois
New Means for the Safe and Effective Relief of Pain
John S. Lundy, Chicago, Illinois
Neurological Surgery
William T. Peyton, Minneapolis
Psychological Management of the Patient and His Family
Howard P. Rome, Rochester

7:00 ANNUAL BANQUET.....Elizabethan Room, Hotel Kahler
Presentations:
Fifty Club Certificates
Southern Minnesota Medical Association Medal
Distinguished Service Award
"Education for a World of Change"—Dr. Laurence M. Gould, President, Carleton College, Northfield

GENERAL SESSIONS

Mayo Civic Auditorium

WEDNESDAY, MAY 25

Morning Session

A.M.

8:30 Visit Scientific and Technical Exhibits

9:00 DRY CLINICS (Concurrent)
Fractures
Mark B. Coventry, Rochester
Hematology
Edwin D. Bayrd, Rochester
Infectious Diseases
Donald R. Nichols, Rochester

10:15 INTERMISSION
Visit Scientific and Technical Exhibits

11:00 DRY CLINICS (Continued)
Peripheral Vascular Disease
R. W. Gifford, Jr., Rochester
Pediatric Surgery
W. H. Weidman, Rochester
Clinical-Pathological Conference
Malcolm B. Dockerty, Rochester

Convention Committees

COMMITTEE ON LOCAL ARRANGEMENTS

General Chairman—E. W. Johnson, Jr.

Advisory—J. M. Stickney, Chairman; Victor Johnson, C. W. Mayo, A. M. Olsen, H. M. Carryer, H. H. Young, C. H. Hodgson, R. J. Jackman, W. E. Wellman, G. R. Diessner.

Banquet and General Entertainment—David Daly, Chairman; Oliver H. Beahrs, Colin B. Holman.

General Facilities—Edward A. Banner, Chairman; Harry F. Burich, Mr. Richard W. Cleeremans, David G. Decker, James R. Doyle, Clifford F. Lake.

Golf—Hillier L. Baker, Jr., Chairman; Richard M. Steinhilber, Donald L. Carlon, David A. Randall.

Public Relations—James R. Eckman, Chairman.

Scientific Exhibits—A. J. Bianco, Jr., Chairman; James W. Halvorson, James R. Doyle.

Skeet and Trap Shooting—Norbert O. Hanson, Chairman; Clifford F. Lake, Wallace A. Merritt, Willard E. Peterson, Earl V. Wetzel.

Woman's Auxiliary—Mrs. O. H. Beahrs, Chairman.

COMMITTEE ON SCIENTIFIC ASSEMBLY

Clarence Jacobson, *President, General Chairman* ..... Chisholm
B. B. Souster, *Past President* ..... St. Paul
Mr. Harold W. Brunn, *Executive Secretary* ..... St. Paul

Section on Medicine

Arthur M. Olsen ..... Rochester
R. S. Ylvisaker ..... Minneapolis

Section on Specialties

L. M. Hammar ..... Mankato
Philip N. Bray ..... Duluth

Section on Surgery

F. M. Owens, Jr. ..... St. Paul
C. F. Brigham, Jr. ..... Duluth

Section on General Practice

Cyril R. Tifft ..... St. Paul
H. E. Drill ..... Hopkins

Zumbro Valley Medical Society

W. E. Wellman, *President* ..... Rochester
C. H. Hodgson, *Vice President* ..... Rochester
E. W. Johnson, Jr., *Secretary-Treasurer* ..... Rochester

PRELIMINARY PROGRAM

Woman's Auxiliary

38th Annual Meeting

PROGRAM

MONDAY, MAY 23

A.M.

9:00-10:30 Registration.....Kahler Hotel Lobby

10:30 Executive Board Meeting.....Mayo Foundation House, 701 4th Street S.W.

P.M.

1:00 Executive Board Luncheon....Mayo Foundation House
All Board Members are cordially invited (Courtesy of Mayo Clinic)

2:00-3:00 Registration.....Kahler Hotel Lobby

3:00-5:00 Tea..Mrs. C. W. Mayo, Hostess, Mayowood
Open to all visiting women. Cars leave North entrance of Kahler Hotel from 3:00-3:45 p.m.

9:00 Open House.....Mayo Civic Auditorium Theater

TUESDAY, MAY 24

A.M.

9:00 Registration.....Kahler Hotel Lobby

9:30 Annual Meeting.....Cloud Room, Kahler Hotel
Open to ALL members of the Auxiliary
Presiding—Mrs. M. F. Fellows, President, Duluth
Pledge of Allegiance and Auxiliary Pledge—Mrs. M. I. Hauge, Clarkfield
"I pledge my loyalty and devotion to the Woman's Auxiliary to the American Medical Association. I will support its activities, protect its reputation and ever sustain its high ideals."
Address of Welcome—Mrs. O. H. Beahrs, President, Zumbro Valley Auxiliary, Rochester.
Response—Mrs. David Halpern, Brewster
Presentation of Convention Chairman—Mrs. D. C. Dahlin and Mrs. H. F. Polley, Rochester
In Memoriam Service—Mrs. J. M. Waugh, Rochester
Music: Mrs. Guy Whitehead
Greetings from National Association — Mrs. Frank Gastineau, Indianapolis, Indiana, National President
Reports
Election of Officers

P.M.

1:00 Annual Luncheon.....Elizabethan Room, Kahler Hotel
Tickets $2.75
Installation of President, Officers and Presentation of President's Pin—Mrs. A. J. Bianco, Duluth
Presentation of Gavel
Greetings from New President—Mrs. W. P. Gardner, St. Paul
Speaker — Mrs. Lynn Pontius —"Accessories Make THE Difference"
Post Convention Board Meeting.....Mezzanine, Kahler Hotel

7:00 Annual Banquet.....Elizabethan Room, Kahler Hotel

Presiding—W. E. Wellman, M.D., President, Zumbro Valley Medical Society

Introduction of Woman's Auxiliary President—Mrs. W. P. Gardner

Presentations—
Fifty Club Certificates
Southern Minnesota Medical Association Medal
Distinguished Service Award

"Education for a World of Change"—Dr. Laurence M. Gould, President, Carleton College, Northfield

WEDNESDAY, MAY 25

A.M.

10:00 Coffee.....Mrs. D. C. Dahlin and Mrs. H. F. Polley, Hostesses
1015 Plummer Circle
All visiting women are cordially invited. (Courtesy of Zumbro Valley Medical Auxiliary.)
Cars leave North entrance of Kahler Hotel from 10:00 a.m.-10:30 a.m.

Committees

General Arrangements—Co-Chairmen: Mrs. H. F. Polley, Mrs. D. C. Dahlin

Reservations—Co-Chairmen: Mrs. R. E. Symmonds, Mrs. N. O. Hanson

Tickets—Co-Chairmen: Mrs. J. W. Henderson, Mrs. J. H. DeWeerd

Registration—Co-Chairmen: Mrs. D. E. Ralston, Mrs. C. F. Stroebel, Jr.

Hospitality—Co-Chairmen: Mrs. H. M. Carryer, Mrs. H. A. Andersen; Mrs. J. W. DuShane, Mrs. J. R. Hill, Mrs. F. R. Keating, Jr., Mrs. C. F. Lake, Mrs. G. B. Logan, and Mrs. E. E. Wollaeger

Transportation—Chairman: Mrs. C. A. Good, Jr.; Mrs. W. H. Bickel, Mrs. R. B. Wilson, Mrs. H. H. Young

Press—Mrs. J. K. Masson

Flowers—Mrs. G. R. Diessner

Pages—Chairman: Mrs. V. O. Wilson; Mrs. J. R. Doyle, Mrs. K. A. Lofgren, Mrs. F. T. Maher, Mrs. H. A. Wente

Executive Board Meeting and Luncheon—Chairman: Mrs. G. M. Martin; Mrs. D. J. Erickson, Mrs. A. A. Frethem, Mrs. J. E. Verby, Jr.

Annual Tea—Co-Chairmen: Mrs. C. W. Rucker, Mrs. G. A. Peters; Mrs. N. A. Christensen, Mrs. E. C. Elkins, Mrs. F. H. Krusen, Mrs. W. M. McConahey, Jr., Mrs. J. P. Whisnant

Annual Meeting and Luncheon—Co-Chairmen: Mrs. K. B. Corbin, Mrs. J. M. Waugh; Mrs. J. A. Bastron, Mrs. K. D. Devine, Mrs. C. F. Gastineau, Mrs. T. G. Martens

Wednesday Coffee—Co-Chairmen: Mrs. H. F. Polley, Mrs. D. C. Dahlin

Finances—Mrs. D. G. Hanlon

Scientific Exhibits

Acute Tendon Ruptures, Recognition and Treatment
KENATH H. SPONSEL, Colonial Orthopedic Center

Association of American Physicians and Surgeons
Blue Shield
Minnesota Medical Service, Inc.

Control of the Organic Hyperkinetic Behavior Syndrome in the Elementary School Child
V. RICHARD ZARLING and JOE HOGAN, Ph.D.

Education of the Juvenile Diabetic
DONNELL D. ETZWILER, St. Louis Park Medical Center

Mayo Clinic and Mayo Foundation

Tumors of the Parotid Gland, Their Surgical Management
O. H. BEAHRS, K. D. DEVINE, L. B. WOOLNER

Misleading Calcific Shadows in the Abdomen
L. G. BARTHOLOMEW, J. C. CAIN, G. D. DAVIS, A. H. BULBULIAN

Secretory Otitis Media in Children
C. F. LAKE, R. L. J. KENNEDY

Congenital Muscular Torticollis (Wryneck)
M. B. COVENTRY, L. E. HARRIS, A. J. BIANCO, JR.

Minnesota Department of Civil Defense
The Minnesota Civil Defense and Disaster Medical Care Program

Minnesota Department of Health, Division of Hospital Services
Hospitals and Nursing Homes

Minnesota Department of Health and Minnesota State Dental Association
The Askov Dental Demonstration

Minnesota Department of Public Welfare, Division of Child Welfare
Adoption Agencies in Minnesota

Minnesota Heart Association
Work Evaluation Unit

Minnesota Medical Foundation

Minnesota Society for Crippled Children and Adults, Inc., Easter Seals Service

Minnesota Society of Medical Technologists
Educated Minds and Trained Hands

Minnesota Society for Prevention of Blindness
Blindness Prevention in Minnesota

Minnesota State Medical Association (Committee on Child Health and Immunization) and Minnesota Department of Health
Accidents: Childhood's Greatest Health Hazard

Minnesota State Medical Association (Committee on Public Health Nursing)
The Public Health Nurse . . . A Community Resource for Good Patient Care

Minnesota State Medical Association (Heart Committee), Minnesota Heart Association, Minnesota State Pharmaceutical Association, Minnesota Department of Health
Rheumatic Fever

Minnesota State Pharmaceutical Association

Minnesota Tuberculosis and Health Association
Minnesota Tuberculosis Story

Muscular Dystrophy Associations of America, Inc.
Help and Hope for the Dystrophic Patient

National Cystic Fibrosis Research Foundation
Cystic Fibrosis, The Most Serious Pediatric Pulmonary Problem

Olmsted County Association for Mental Health

Surgical Aspects of Thoracic Aneurysms
JOSEPH J. GARAMELLA, W. R. SCHMIDT, and N. K. JENSEN

University of Minnesota Medical School, Division of Dermatology
Griseofulvin Therapy for Dermatomycoses
JAMES L. TUURA, DUANE R. ANDERSON, and FRANCIS W. LYNCH

Veterans Administration Hospital
Oscillometric Arterial Circulatory Norms
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Welcomes . . . .

The Minnesota State Medical

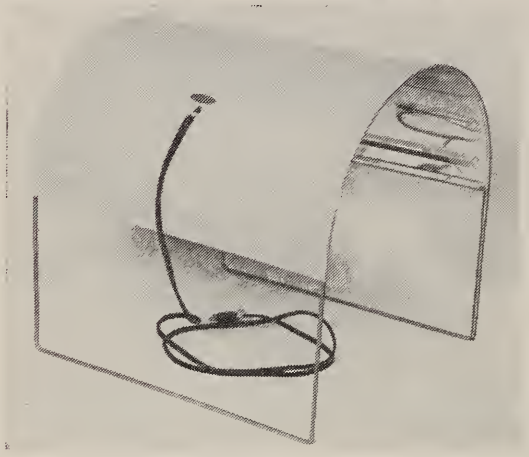
Association to Rochester, Minnesota

for the 107th Annual Meeting,

May 23, 24, 25, 1960

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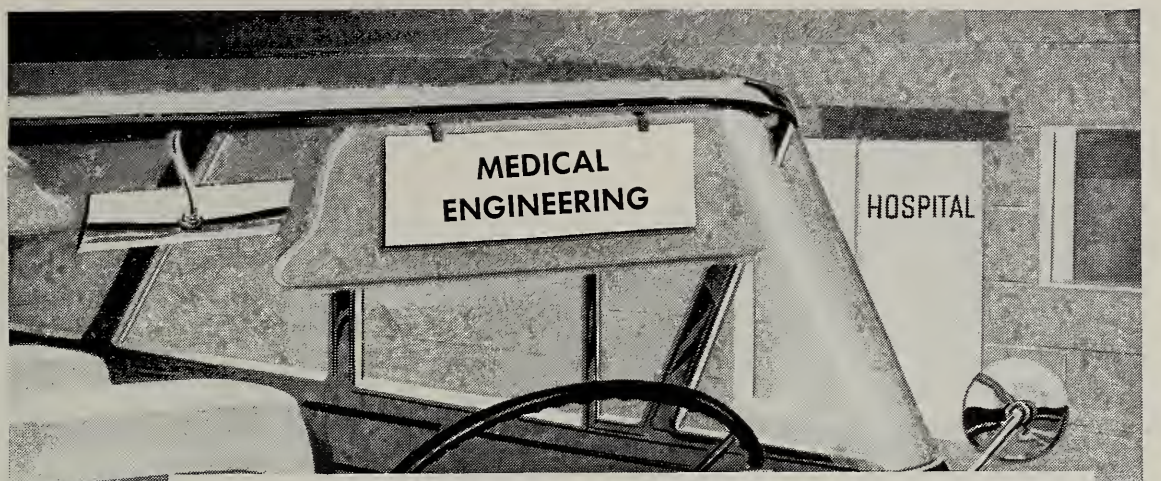
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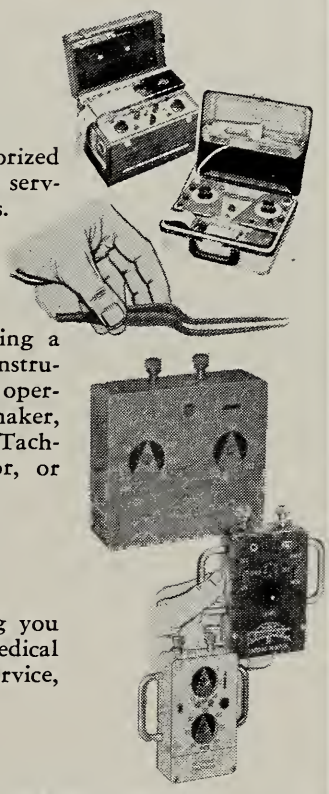
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Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

THE AMA RECORD VERSUS "POLITICAL MEMO FROM COPE"

The AFL-CIO Committee on Political Education (COPE), on February 1, 1960, published a political memorandum entitled "The Forand Bill and the Record of the AMA." The memorandum consists of sixteen charges purporting to show that the American Medical Association has opposed beneficial health measures. The memorandum suggests that the Association's opposition to the Forand Bill is another example of this so-called "reactionary" attitude.

Although the COPE statement cites no references, it is taken almost word for word from a a campaign speech delivered on October 27, 1950, by former Congressman, Eugene D. O'Sullivan, from the Second Congressional District of Nebraska. After losing his campaign for re-election, Congressman O'Sullivan had the speech printed in the Congressional Record of December 8, 1950.

The memorandum contains so many falsehoods and distortions that AMA's President, Dr. Louis M. Orr, has demanded a retraction of the statements. The demand for a retraction and a factual explanation of the Association's position on the health measures mentioned in the COPE memo were contained in a letter written by Doctor Orr on March 15, 1960, to George Meany, President of AFL-CIO.

Following are the allegations and the facts:

Allegation

1. *"A generation ago, the AMA opposed the requirement that all cases of tuberculosis be reported to a public authority—the foundation for all tuberculous control methods."*

Facts

The AMA has not opposed reporting cases of tuberculosis to a public authority.

The history of the Association's interest in the control of tuberculosis can be traced back to 1899, when the House of Delegates appointed a Committee to report on the nature of tuberculosis, means of control, public education and the advisability of establishing national and state sanitariums.

The most recent AMA action on this subject was in 1944 when a resolution on the control of tuberculosis was approved. It stated in part "that it is necessary to extend procedures for careful, continuous supervision of the tuberculous by practicing physicians, who, in cooperation with duly constituted health authorities, federal, state and local, are in a position to deal with these problems by modern methods to prevent the spread of this communicable disease."

Allegation

2. *"The AMA opposed the National Tuberculosis Act a week before Congress passed it unanimously."*

Facts

Although the House of Delegates was in sympathy with the purposes of the proposed National Tuberculosis Act, it opposed the bill for the following reasons:

(1) Money could not be appropriated or expended for the purposes of the legislation without the approval of the Federal Security Agency.
(2) The objectives of the legislation could be obtained in other ways, as for example, direct aid to needy communities under the Lanham Act.

Allegation

3. *"The AMA fought compulsory vaccination for smallpox."*

Facts

This statement would be accurate if it said: The AMA fought *for* compulsory vaccination for smallpox because in 1899, the House of Delegates adopted a resolution which urged local boards of health to adopt laws requiring compulsory vaccination for smallpox.

Allegation

4. *"The AMA attacked provisions for immunization against diphtheria and other preventive measures against contagious diseases by public health agencies."*

Facts

The AMA has not only cooperated with public health agencies for the prevention of contagious

diseases, but also has made many recommendations for affirmative action in this field. The following are only a few examples of AMA activity:

(1) From 1875 to 1879, the AMA urged "that state boards of health be established in those states where such boards do not exist."

(2) In 1884 it recommended that Congress "make suitable appropriations for the prosecution of scientific research relating to the cause and prevention of the infectious diseases of the human race," and also in that year passed a resolution that "it is important that proper legislation be had at this session of the National Congress for the ultimate extermination . . . of pleuropneumonia."

(3) In 1907 the Committee on Legislation was requested by the House of Delegates to take the necessary steps to secure national and state legislation for control of rabies.

(4) A report adopted by the House of Delegates in 1950 read in part, as follows: "The basic services of the department of public health should be . . . prevention of disease and control of communicable disease such as the diseases of childhood, venereal diseases and tuberculosis."

Allegation

5. *"The AMA opposed the first bills to grant Federal aid to the states to reduce infant and maternal deaths."*

Facts

In 1922, the AMA opposed the Sheppard-Towner Maternity and Infancy Act, which authorized the payment of subsidies to the states over a fixed period of years because it believed that each state should be left free to formulate its own maternal-infant welfare programs with the cooperation of the United States Public Health Service and that any legislation involving cooperation between the federal government should be jointly administered by the USPHS and state health authorities.

Allegation

6. *"The AMA opposed the Social Security Act, passed in 1935."*

Facts

The AMA has never taken a position on the retirement provisions of the Social Security Act.

Allegation

7. *"In 1939, on behalf of the AMA Board of Trustees, Doctor Morris Fishbein condemned old-age and employment insurance as a 'definite step to either communism or totalitarianism'."*

Facts

The quotation attributed to Doctor Fishbein is taken out of context. In November, 1939, Doctor Fishbein, who was then Editor of the *Journal of the American Medical Association,* addressed the Annual Conference of Secretaries of Constituent Medical Associations on the AMA's position on health legislation. He said, "We are asking the government to go forward with the medical profession in attaining a wider distribution of medical and preventive services based on actually demonstrated needs of various communities . . ." He then went on to discuss medicine's plans for achieving this result and some problems which had resulted from the construction of facilities by the federal government where there was no demonstrated need. The only reference to social security occurred in the conclusion of the speech:

> "The introduction into this nation of a federal security plan whereby the national itself, as a federal agency, will step intimately into the sickness and life of every person in the country, will be the first step in the breakdown of American democracy. Indeed, all forms of security, compulsory security, even against old-age and unemployment, represent a beginning invasion by the state into the personal life of the individual, represent a taking away of individual responsibility, a weakening of national caliber, a definite step toward either communism or totalitarianism."

It is clear that the subject of Doctor Fishbein's remarks was health care, not social security. Even his one reference to social security showed more concern over the possible future consequences of compulsory programs than antagonism toward the old-age and unemployment insurance program. Since the AMA did not oppose old-age and unemployment insurance, it is difficult to see what this COPE allegation is trying to "prove."

Allegation

8. *"The AMA opposed the creation of public venereal disease clinics."*

Facts

The AMA has fought venereal disease as it has other diseases which have threatened the American public. In 1907, it resolved "that it should be the duty of state boards of health to disseminate literature . . . to educate the people on the subject of venereal disease." Other actions have included:

(1) Cooperation of the American Medical Association with the United States Public Health Service for better control of venereal disease.

(2) Statements that the medical profession should cooperate with the official health agencies charged with the responsibility for an expanded program for the control of venereal diseases that has been made possible by federal grants-in-aid.

(3) A twelve-point program for improved medical care which included "Establishment of local public health units and incorporation in health centers and local public health units of such services as . . . control of venereal diseases . . ."
(4) Approval of the treatment of nonindigents for venereal disease by public health clinics in instances when such treatment is not available through private sources.

Allegation

9. *"The AMA opposed the creation of free diagnostic centers for tuberculosis and cancer."*

Facts

In 1948, the House of Delegates approved a resolution which authorized the Association to cooperate with the American Cancer Society and other agencies engaged in cancer detection "for the purpose of formulating standards of procedure and conduct in the operation of cancer detection and diagnostic centers and that the results of these studies be adequately publicized to those concerned, including the medical profession and the public."

As part of its program for improved medical care, the AMA approved the diagnosis of tuberculosis by the treatment of indigents by public health centers. In addition, it approved the treatment of nonindigents by these centers if treatment is not available through private sources.

Allegation

10. *"The AMA fought the American Red Cross plan to set up a nation-wide reserve of civilian blood banks."*

Facts

The AMA, instead of fighting the Red Cross plan for blood banks actively supported such a plan. This consistent approval is shown by the following actions:

(1) 1947—approval in principle of the American Red Cross Plan establishment of a national blood program.
(2) 1949—the AMA statement that there was an urgent need for a national blood program and that the Red Cross was the logical agency to assume the responsibility for such a program.
(3) 1953—the House of Delegates urged the establishment of a coordinated national blood bank program to be organized by the AMA, American National Red Cross, and other qualified organizations.
(4) 1954—the AMA adopted a plan for a national blood program which was developed and unanimously approved by representatives of the American Red Cross, the American Hospital Association, the American Association of Blood Banks, the American Society of Clinical Pathologists and the Committee on Blood of the American Medical Association.

Allegation

11. *"The AMA opposed Federal aid to medical education even after AMA representatives had testified before Congress that the medical schools were in dire financial emergency, and that there was a serious shortage of doctors in the U. S."*

Facts

The AMA would prefer to see necessary support for medical education received from private philanthropy or local public funds. However, it is recognized that until such support is provided, federal aid may be necessary if the legislation guarantees absolute freedom of medical education under government control.

In 1951, the Association endorsed the principle of one time grants-in-aid based on the Hill-Burton formula for the construction, equipment and renovation of the physical plants of medical schools. The funds were not to be used for operational expenses or salaries. This position has been reaffirmed by the House of Delegates several times.

The AMA has opposed bills for federal aid to medical education which did not guarantee freedom of medical education and which would have provided funds for salaries.

Allegations

12. *"The AMA attacked voluntary health insurance plans as 'socialism, communism—inciting to revolution.' (ho, hum.)"* and
13. *"It dismissed Blue Cross as 'a half-baked scheme'."*

Facts

The first quotation is taken out of context. It is from an editorial in JAMA of December 3, 1932, concerning two reports of a Committee on the Cost of Medical Care. The majority report urged medical practice by organized groups of physicians associated with hospitals. Commenting on this, the *Journal* said: "The alignment is clear —on the one side, the forces representing the great foundations, public health officialdom, social theory—even socialism and communism—inciting resolution; on the other side, the organized medical profession of the country, urging an orderly evolution." It should be noted that this same editorial referred to health insurance as "foresighted, American, economical."

The second quotation does not even mention Blue Cross. It is from a *Journal* editorial of March 25, 1933, which criticized the attempts of some individuals to make large profits from health insurance. The AMA has never opposed the development of voluntary sickness insurance plans in this country as they exist today.

Allegation

14. *"The AMA opposed school health service legislation."*

Facts

This statement apparently refers to testimony given by the AMA on H.R. 3942 81st Congress. Our witness stated that the Association was in agreement with the general purpose of the bill and considered it so worthwhile that we would not oppose it if we did not feel that, in its present form, it would fail to accomplish its purpose. It should be remembered that there is a great deal of difference between opposing the principles of a particular type of legislation and opposing an ineffectual bill.

Allegation

15. *"The AMA fought federal aid to public health units."*

Facts

The following statement, which reflects the AMA's position in regard to this subject, is taken from testimony given before the House Interstate and Foreign Commerce Committee on July 6, 1949: "We, the American Medical Association, have long believed that the existence of . . . public health units is basic to the maintenance of and improvement of the health of our people. Recognition of this conviction was reflected in action taken by the Association as early as 1883, when a report was made at our annual meeting for that year covering a survey conducted to ascertain what states and counties had at that time health departments." The AMA has not opposed aid to public health units, but has suggested amendments which would define the term "public health" as used in the proposed laws and which would exclude care of the sick.

Allegation

16. *"The AMA blasted a Defense Department request to Congress to give Government medical care to dependents of men in the Armed Forces, with particular reference to the men then fighting in Korea as 'unpractical and harmful to National Defense'."*

Facts

The AMA testified on H.R. 7994, 84th Congress, which became the Dependent Medical Care Act and in this testimony stated:

"As you know, on the basis of our previous testimony, the American Medical Association has taken no position on the question of whether it is the responsibility of the government to provide medical care for the dependents of military personnel. In our opinion this is a question for Congress to decide. We do strongly urge, however, in the event such care is to be provided, that increased emphasis be placed on the utilization of civilian facilities and the services of civilian physicans."

The quotation in the allegation does not appear in the testimony or in any statement of AMA policy. In fact, the House of Delegates, when expounding its policy on medicare, specifically stated: "The policy advocated should not in any way be construed as one of opposition by the American Medical Association to dependent medical care; . . ."

CARE COVERAGE FOR THE AGED

Health Insurance companies are demonstrating effectively their capacity for providing medical, surgical, and hospital care coverage for older people, Robert R. Neal, General Manager of the Health Insurance Association of America, said recently.

Rapid Development of "Over Sixty-five" Plans Noted

Mr. Neal, speaking in Washington, D. C., during the annual meeting of the American Association of University Teachers of Insurance, emphasized that the insurance carriers are making rapid strides in developing and offering health insurance programs specifically designed for people age sixty-five and over. Among the plans offered to older persons who want assistance in meeting their health care expenses, he named the following:

"1. Continuation of insurance on older active workers under group insurance plans.

"2. Continuation of group insurance on retired workers and their dependents, generally with part or all of the premium paid by the employer.

"3. Continuation on an individual-policy basis of coverage originally provided by group insurance.

"4. New issuance of group insurance at advanced ages.

"5. Continuation into the later years of individual insurance bought in the productive years.

"6. New issuance of individually-purchased policies at advanced ages.

"7. Issuance of insurance that becomes paid-up at age sixty-five."

Many health insurance companies have been writing policies in line with or similar to these plans for some time, Mr. Neal brought out. The companies, he said, are gearing their efforts to the need for providing more and better coverage at a cost which the public can pay. Looking to the future, Mr. Neal added:

"It is reasonable to assume that within a few years most private health insurance carriers will have acted to eliminate the older policyholder's anxiety that his coverage will not be renewed when he reaches age sixty-five. Moreover, it can be expected that coverage of persons over age sixty-five will increase more rapidly in the future."

Government Interest in Insurance Field Increases

The growing complexity of the social and economic consequences of health insurance has been attended by increasing Federal Government interest in the operations of insurance companies. As recent evidences of the extent of Federal activities of considerable concern to the insurance business, Mr. Neal listed these actions: The creation of the Senate Labor Subcommittee on problems of the aged and aging, and the public hearings held this year by that group; the introduction of the Forand Bill, H.R. 4700, which would append health insurance to the Social Security program; and congressional authorization of the White House Conference on Aging, to be held in January, 1961.

Dangers of Government Health Insurance Explained

There is a very real danger, the HIAA official pointed out, of Federal intervention in the field of health insurance. He told his audience:

"Should that intervention occur, the Government would take over a large and important area which has been the responsibility of the enterprise system. Obviously, the establishment of Federal administrative machinery to operate health insurance programs could possibly be the forerunner of government intervention in other fields of insurance. Workmen's compensation, the casualty lines, and life insurance could and would likely become targets of further Federal encroachment."

Mr. Neal summed up the position of the health insurance business, as regards possible national government intervention in health insurance operations, in the following terms:

"Admittedly, the issues involved are broad, and it is not easy to deal with them. The main objective to be served is the public interest. The basic issue, then, is whether the voluntary system, which has achieved so much for so many millions of people in so short a span of years, is to be permitted to demonstrate that it can and will continue to serve the public interest with greater effectiveness and at lower cost than can the cumbersome, rigid, and expensive methods which would be employed by those who advocate governmental intervention."

LOW DRUG PRICES MAINTAINED DURING INFLATION, SENATE INVESTIGATORS TOLD

"Americans would be paying a billion dollars a year more for drugs if the price of medicine in the past few years had gone up only as much as the total cost of living." Dr. Austin Smith, President of the Pharmaceutical Manufacturers Association, told Senate investigators.

He said the drug industry has "an outstanding record of low prices maintained in an inflationary period." Doctor Smith testified before the Kefauver Anti-Trust Committee in rebuttal to the Senator's criticisms of industry practices.

He declared, furthermore, that "on the basis of the record," he knows of "no other American industry that has contributed more from its resources to the public welfare."

Life Span Increased by New Drugs

Modern drugs have helped to add nearly ten years to the lifespan of the average American within the past thirty years, he observed, adding: "since 1947 this industry has spent about $1 billion in research alone."

He said the pharmaceutical industry has served the public interest by driving prices down to the lowest possible levels.

Scoring earlier criticism of industry prices, he said there is "grave danger of misinforming the public when attention is directed toward the single product of a single company . . . without relating these to the many thousands of products produced by the entire industry."

Competition Is Healthy

Doctor Smith declared that the competitive pharmaceutical industry in America "has played a role unparalleled elsewhere in the world in reducing human suffering and in helping to eradicate diseases which have crippled mankind for centuries."

Citing the lack of inventiveness in drugs within the Soviet Union, he emphasized that "there has been no missile gap in pharmaceutical research."

Recalling major breakthroughs attributable in significant ways to U. S. drug industry laboratories, Doctor Smith named the discovery and development of the sulfa drugs, the synthesis and discovery and development of high-potency corticosteroids, the mass production of penicillin, and

the discovery and development of the other broad-spectrum antibiotics.

Research Risks Noted

Emphasizing the "staggering investment" which the drug industry puts into research, Doctor Smith said that "the chance that any given research involving a new potential medicine will be successful stands at 2,865 to one against the manufacturer."

He said the industry's research resulted in valuable palliative treatment for cancer, and that the industry was also responsible for the discovery and development of tranquilizer drugs for treating mental illness, oral diabetic drugs, and the hydrazide derivatives for treating tuberculosis.

New Drugs Save Dollars

Doctor Smith said that every major advance of the U. S. drug industry has been accomplished by "astronomical dollars-and-cents savings to the American people."

He said that vast reductions in medical expenses were made possible by rapid cures for illnesses and by the shorter length of hospitalization which results in increased productivity of those to whom new drugs have made cure possible.

Doctor Smith said that this has also meant "mammoth tax savings to the public" by reducing the cost of public health services.

The drug industry official took issue with the committee for airing opinions of individuals critical of the industry without hearing from persons who represent "unquestioned authority."

He cited statements by Dr. James Watt, Director of the National Heart Institute, and Dr. Robert H. Felix, Director of the National Institute of Mental Health, crediting the drug industry for development of important medicines in these fields.

Benefits of Modern Chemotherapy Noted

He said that modern chemotherapy "permits a physician to treat many specific organs, and to conquer many specific diseases, with the precision of a surgeon using a scalpel." Listing some of the benefits of medicine within the past two decades, he said:

"More than 3,000,000 Americans, living today, would be dead if the nation's death rate had remained constant at its 1937 level.

"Between 1930 and 1958 the death rate for babies under one year was cut 57 per cent—for children one to four years, was reduced 80 per cent—for children five to fourteen years, was reduced 71 per cent.

"Only as recently as the years 1930 to 1934, one of every 157 mothers died at childbirth. From one out of 157, this number was slashed to one out of 2,222 in the four years ending in 1958.

"In the past thirty years alone, modern drugs have helped add nearly ten extra years to the U. S. lifespan."

MINNESOTA GOP TAKES ANTI-FORAND STAND

The Minnesota Republican Welfare Advisory Committee recently issued a statement opposing the highly controversial Forand Bill on the grounds that old age medical assistance can be and is being more adequately handled at the state level.

"The Minnesota Old Age Assistance medical program is much more complete than that provided in the Forand Bill, because we give complete medical, drug, surgical, hospital, dental and nursing home care," the GOP committee stated in a resolution being sent to Republican district conventions.

"Under a Republican state administration in 1945, maximum limits were removed on all types of medical care for the aged. Ever since 1945, Minnesota has through its old age assistance medical program met the needs of aged people much more fully and adequately than is true in most all other states.

"Under the Forand Bill, citizens of Minnesota would be called upon to send thousands of dollars out of the state to pay for medical assistance in states which have failed to come to grips with their own problem."

In support of the committee resolution, GOP State Chairman Ed Viehman termed the Forand Bill an "invitation to federal socialized medicine."

"We want to take care of our own problems in this important field, and other states should be encouarged to do likewise," Viehman commented.

The advisory committee, formed to advise the draftees of the welfare plank of the 1960 Republican platform, pointed out that the Forand program is limited in its coverage.

"It would provide a maximum of 120 days of hospital care and nursing care in any twelve-month period.

"It would not provide the type of medical care that is customarily needed by older people, such as is rendered by thousands of general practitioners throughout the state. On the contrary, it is primarily limited to surgical care in certain hospitals.

"Older people need medical care in their own homes, in nursing homes or community hospitals or doctors' offices.

"The people of America, as well as members of Congress, need to know more about the problems of the aged before this major legislative step is taken."

Pointing out that a White House Conference on Aging is scheduled for early next year to consider these matters, the committee urged that action on the bill be postponed until after the results of that conference are known rather than to enact a "stop-gap" plan at this session of Congress.

OPTOMETRISTS SEEK NEW DEFINITION OF "MEDICAL SERVICES"

The House Committee on Veterans Affairs has endorsed H.R. 7966 to amend the definition of "medical services" in Section 601 (6) of Title 38, U. S. Code, to include services of optometrists.

Effect of this legislation is to classify optometric services as "medical services" and provide Federal compensation of optometrists for out-patient care given veterans with service-connected conditions.

Favorable House action is likely unless strong protest is registered.

According to analytical comment by the National Medical Foundation for Eye Care, "medical services" should be rendered by medical practitioners. The optometrist is not a medical practitioner.

To classify optometrists among those qualified to render "medical services" implies that they are qualified and authorized to diagnose and treat eye diseases. This constitutes the practice of medicine.

Veterans with service-connected conditions are entitled to the highest quality of medical care. To grant optometrists the right to perform eye examinations may result in failure to administer necessary sight-saving medical treatment and rehabilitative care.

Determination of service-connection requires a medical judgment; and the further decision, whether refraction and glasses are needed as part of the medical treatment, cannot be made until after a diagnostic examination by a medical practitioner. These medical services cannot be rendered by optometrists and it would seldom be feasible, economical or in the best interests of the patient to transfer the patient from the medical to the non-medical practitioner for a portion of the medical eye care required.

CORRECTION

Readers are requested to correct the wording in the next to the last paragraph in Civil Defense News, page 140, in the February issue, wherein the word "Michigan" was printed in error. The sentence should read "The *Minnesota* State Medical Association has been very active in Civil Defense."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

ST. PAUL PAINTER SENTENCED FOR BASIC SCIENCE VIOLATION

On January 15, 1960 John Petschon, thirty-three, 613 N. Grotto St., St. Paul, was sentenced by the Hon. Levi Hall, Judge of the District Court of Hennepin County, to a term of one year in the Minneapolis Workhouse on a charge of practicing healing without having a basic science certificate. Judge Hall then suspended the sentence and placed the defendant on probation for one year under the supervision of the Hennepin County Probation Office. Petschon had previously entered a plea of guilty on December 7, 1959 to an information charging him with the basic science violation.

Petschon had originally been charged with the crime of abortion in a complaint signed by a representative of the Minnesota State Board of Medical Examiners on November 6, 1959. However, the authorities later decided that the facts and circumstances surrounding the case justified reducing the charge from a felony to a gross misdemeanor. A written statement signed on October 23, 1959 by a seventeen-year-old, married Edina woman indicated that although two attempts were made to perform an abortion upon her in July, 1959, she did not abort and, at the time the statement was given, she was approximately seven months pregnant. The evidence also indicated that all of the arrangements for the abortion, including the payment of $300 to Petschon, had been made by her mother and by her husband's parents and grandparents. The abortion complaint was therefore dismissed and a charge of violating the basic science law was filed against the defendant.

Upon being questioned by Judge Hall prior to being sentenced, Petschon stated his occupation is that of a painter. Although the defendant admitted that he had been paid $300 in this case, he claimed that he did not "really try" to perform the abortion but that he "just needed the money." Petschon has no training in medicine and is not licensed to practice any form of healing in Minnesota. The defendant denied that he had previously been convicted of a criminal offense and a search of the records failed to disclose that he has a prior conviction.

TOTAL AVERAGE COSTS FOR FOUR YEARS OF MEDICAL SCHOOL AND STUDENT INDEBTEDNESS

The total average expenses, according to family composition for four years in medical school were tabulated for 4,277 men members of the graduating class of 1959. Assuming that expenses were evenly distributed for each of the four years, the total cost per year would be: $2,376 for a single student; $2,763 for a married student; $3,210 for a married student with one child; and $3,925 per year for a married student having two or more children.

A sample study of medical student financial considerations in 1953 by Counts & Stalnaker indicated that about one-third of the medical students expected to be in debt at graduation and 3 per cent expected to be in debt more than $10,000. The preliminary figures for the 1959 graduating class show 52 per cent actually in debt, and 6.5 per cent in debt more than $10,000.—Association of American Medical Colleges.

Medical Legal Opinion

● *The purpose of this section entitled Medical Legal Opinion is to publish news of recent litigation concerning medical practice as well as to cite past actions and opinions of the Court in medical legal matters as a means of refreshing our knowledge of such procedures.*

Code for Interprofessional Relations

Minnesota State Bar Association

Minnesota State Medical Association

The following Code has been drafted by the joint efforts of the Medical Advisory Committee of the Minnesota State Medical Association and the Interprofessional Code Committee of the Minnesota State Bar Association. It should be a helpful guide and standard for professional conduct in both professions. Medical legal problems whether desired or not, have become a part of our job. The Code is informative and worthy of your study. It is to be considered for official adoption by both the Minnesota Medical and Bar Associations at the 1960 Spring Meetings.

HARVEY NELSON, M.D.
Chairman, Medical Advisory Committee

PREAMBLE

Acknowledging that a substantial part of the practice of law and medicine is concerned with the problems of persons who are in need of the combined services of an attorney at law (hereinafter called lawyer) and a doctor of medicine (hereinafter called physician), and that the public interest and individual problems in these circumstances are best served by the co-operative efforts of all concerned, we, the members of the Minnesota State Bar Association and the Minnesota State Medical Association, do hereby adopt the following interprofessional code as the standard for proper, ethical conduct for lawyers and physicians.

INTERPROFESSIONAL RELATIONS

Physicians and lawyers, as members of learned professions, have much in common. The state licenses the members of each profession to administer to the needs of and to carry out social responsibility to the public. Each is dedicated to the principle of free choice—freedom of choice in the selection of a physician to safeguard the health of the individual, and freedom of choice in the selection of a lawyer to safeguard an individual's freedoms and rights as a citizen. Each is bound by a code of ethics dedicated to the most worthy objectives inherent in the trust placed in each profession by the community.

The physician has responsibility for the care of his patient, not only in health but also in disease and injury. He is the adviser and confidant of his patient in matters of health. He must administer to the needs of his patient to the best of his ability and in accordance with the high precepts of the Hippocratic Oath.

The lawyer represents his client as advocate in legal proceedings and as counsellor in business and personal affairs. He is the adviser and confidant of his client in legal matters. He performs his duties as an officer of the court, sworn to support and defend the Constitution of the United States and of the state or states in which he is admitted to practice with high standards of conscience and morality.

The members of each profession are pledged to maintain the confidence and to preserve inviolate and secrets of their patients or clients, as the case may be.

Each profession is obligated by its own stature to respect and honor the calling of the other. Neither the fact nor the appearance of incompetence, corruption dishonesty or unethical conduct on the part of individual members of either profession can be tolerated. It, therefore, follows that each profession must vigorously support within its own ranks, as well as within the ranks of the other, those ethical concepts which each has found necessary in the public good. But when doing so, the

Action is to be taken on this code by the two organizations this spring.

members of each profession must keep in mind that the members of the other profession have been found competent to be such by appropriate authority, that there are differences in the capacities and characteristics of the practitioners of the other profession, and that while law and medicine may each be termed a science, each is an inexact science and such inexactness is and always will be accented by the human limitations of its practitioners.

This interprofessional code constitutes recognition that with the great development in the science and art of both medicine and law, physicians and lawyers are drawn into more and more associations, as the law calls with increasing frequency upon medicine for its scientific knowledge and its evaluation of facts so that the rights of individuals may be appropriately determined before various tribunals.

I. Medico-Legal Aspects Before Trial

The physician becomes involved in the legal process either because he has been engaged for the purpose of diagnosis, care or treatment of some patient whose legal rights are being litigated or because he has been engaged for the purpose of litigation rather than for diagnosis, care or treatment. If he is a physician engaged for the purpose of diagnosis, care or treatment, he will be referred to herein as the attending physician, whether he was the physician who treated the patient during the entire course of his illness or injury or the physician called as a specialist with respect to certain aspects of diagnosis, care or treatment of the patient. If he is a physician engaged for the purpose of litigation, he will be referred to herein as the examining physician.

A. *Professional Obligation of Physician to Patient in Regards to Litigation.*—The attending physician has a duty to assist his patient with respect to any litigation involving the conditions which the physician has treated. This duty arises from his general obligation to assist in the administration of justice and his specific responsibility for the welfare of his patient.

Administration of justice is essential to orderly society. An effective system for settlement of claims involving the physical or mental condition of a person is essential to judicial administration. Disposition of such claims either by trial or in anticipation of trial must be based on facts relating to (1) liability and (2) damages. The attending physician, by virtue of the confidence reposed in him by his patient has unique knowledge of the physical and mental condition of his patient; the care and treatment required; and the degree of permanent loss, if any, to be anticipated. The issue of damages cannot be fairly resolved without these facts.

It is for the physician to determine the actuality or probability of facts pertaining to his patient's condition. It is for the lawyer to determine when, how and under what circumstances such facts are most appropriately to be presented.

B. *Medical Conduct Before Trial.*—The information obtained by the attending physician in the course of his examination and treatment of a patient and any written report thereof are legally privileged, except that in situations involving the Workmen's Compensation Act an attending physician designated by the Commission or whose services are paid for by the employer may be required to testify as to any information acquired by him in the course of treatment or examination. The information obtained by an examining physician and any written report thereof are not privileged. Nevertheless, an examining physician should not reveal such information or the contents of such report to anyone other than the person employing him without first obtaining the written consent of such person.

Neither the attending physician nor the examining physician should express any opinion to the patient as to the settlement value of any claim for personal injury.

The examining physician, acting for a party adverse to the person he is examining, should, where taking a medical history, attempt to elicit only such facts as are pertinent to his examination; he should not attempt to obtain statements which might constitute admissions with reference to any accident out of which the litigation arises. Such an examining physician should not solicit the findings or the opinions of or consult with the attending physician, nor should he suggest to the person being examined any treatment, comment to such person on any treatment already received, or divulge to such person any of his medical findings or opinions.

It is not desirable for a lawyer to be present when his client is being examined by an examining physician whether the physician is employed on behalf of his client or on behalf of an adverse party, but there is no reason why the lawyer should not discuss with such physician, either before or after the examination, any aspect of the examination that may be pertinent.

C. *Legal Conduct Before Trial.*—A frank discussion of the issues and opinions between the physician on the one hand and the lawyer on the other hand prior to trial is to be encouraged. The lawyer may properly point out the legal foundation for medical evidence and the reasons for it. This does not, however, mean that the physician's testimony must be in accord with these views, for a lawyer by his conscience and his ethics is prohibited from attempting to color or distort the professional opinion of a physician to be called as a medical witness in the trial of a case. Both the lawyer and

the physician must share the responsibility for improperly presented or fraudulent medical testimony. Such testimony is unworthy of both professions.

D. *Medical Reports.*—The physician should always stand ready to furnish written reports to lawyers. This statement applies not only to examining physicians but also to attending physicians. The lawyer when requesting a written report from a physician concerning the condition of a patient should make his request in writing and should direct the physician's attention to the particular condition which interests the lawyer.

The lawyer should not expect an attending physician to furnish a report unless the physician has first received a written authorization from the patient permitting the physician to furnish such a report, or the lawyer's letter to the physician contains a signed acknowledgment by the patient of the lawyer's authority to act in his behalf.

A request for a written report should ask for history, diagnosis, treatment, prognosis and medical fees up to the date of the report.

The physician has an obligation to keep adequate records which may be used to supply to a patient's lawyer all information regarding the patient-client's medical history, and to retain control of x-rays.

Requests for medical reports should be honored promptly, as undue delays in providing medical reports or bills bearing on a patient's legal rights may prejudice the patient's rights.

If a physician is unable to state a complete medical evaluation and prognosis at the time it is required, he should so notify the lawyer and suggest to him that he request a further medical report at a later time. In such instance a preliminary report and medical bill, clearly designated as such, will often serve the patient's needs adequately.

E. *The Interprofessional Conference.*—Personal conferences between the lawyer and each physician, whether he be an attending physician or an examining physician, are always proper and generally should be regarded as professionally obligatory.

Conferences should be scheduled at mutually agreeable times and under circumstances so that they may proceed without interruption.

Several conferences may be necessary. An initial conference long prior to trial and in some cases even prior to the commencement of a lawsuit is often desired by the lawyer so that he may be early apprised of the medical aspects of the claim, knowledge of which is, of course, essential to an evaluation of the claim. Interim conferences to discuss the patient's medical progress are often also necessary. If the physician is to be a witness, a final conference should be held as shortly as possible before the physician is to give his testimony. At this conference the lawyer should explain the legal aspects of the case and the facts he expects to develop; and fully and with complete candor the physician should explain the medical aspects of the case. If a hypothetical question is to be asked, the lawyer should clearly outline it at the conference. The physician should review with the lawyer at the conference all his notes, records, memoranda and x-rays even though he does not intend to use them in his direct examination because they may be used in cross-examination. Before the conference concludes the physician should volunteer any pertinent medical fact not previously discussed.

F. *Arrangements for Medical Testimony in Court.*—The lawyer should make arrangements with the physician who is to be a witness for the physician's appearance at a particular time and place and for the physician's testimony to be given as close to the specified time as possible. It is the obligation of the physician to be present at the specified time. The lawyer should give the physician as much advance notice of the specified time as is reasonably possible, but the physician must realize that the lawyer cannot control the court calendar and that unanticipated dispositions of preceding cases frequently prevent the lawyer from giving as much advance notice as might be desired. When a case is settled, the lawyer should promptly notify all physicians involved. Prompt notice is particularly important when a case is settled after a time for the physician's appearance in court has been set.

G. *Subpoenas to Secure Medical Testimony.*—The lawyer should make every effort to arrange his client's medical evidence without the use of subpoena. In the event medical evidence cannot be obtained by arrangement, the lawyer may subpoena the physician. The physician must appear at the time requested and should not take offense at being subpoenaed. In the event a lawyer finds it necessary to subpoena a physician, the lawyer should notify the physician in ample time, preferably in advance of service of the subpoena, of his intention and insert in the subpoena a time for appearance as nearly as possible acceptable to the physician. A lawyer who subpoenas a physician should not expect the physician to bring with him his notes, records, memoranda and x-rays unless the physician has been served with a subpoena duces tecum.

Even though all physicians are experts in the eyes of the law, a physician can be compelled by subpoena to appear and testify upon tender to him of the statutory witness fees payable to any lay person who is subpoenaed. If a physician who appears in answer to a subpoena is examined with respect to any subject upon which he is an expert, the judge may at the conclusion of his testimony allow him a reasonable expert witness fee.

II. The Medical Witness at Trial

A. *Appearance of Medical Witness.*—The proper, fair and impartial presentation of medical testimony is the joint responsibility of the physician acting as a medical witness and both examining lawyers.

The persons who are to hear and interpret the medical testimony, be it a jury, judge, or other presiding official, must necessarily observe and consider the appearance of the witness and presentation of the testimony. A medical witness should maintain a professional attitude in his appearance and should present his testimony in language that a layman can understand.

Our system of justice assumes that medical witnesses as well as other witnesses are impartial as to the facts within their knowledge. They are not and should not be advocates. A dogmatic, uncompromising, and argumentative attitude assumed by a witness instead of a firm but professional attitude based on honest convictions established on scientific principles will work to the detriment of the witness and as a result will work to the detriment of the patient on whose behalf he is testifying.

A lawyer should not engage in the abuse of any witness, including a physician, whether the witness be called by one side or the other. The established rules of evidence give ample opportunity for testing the competence and credibility of all witnesses, including a physician, making abusive examination on the part of a lawyer unnecessary and unjustifiable.

The physician should realize that it is the privilege and obligation of the lawyer for the opposing side to conduct his cross-examination with a vigor in an effort to explore the foundations of medical opinion and to expose weakness which may appear in either the basis or content of such opinions. The physician should not be upset or assume an antagonistic attitude toward such cross-examination, providing the examining lawyer conducts it in a professional and gentlemanly manner. The physician must realize that such cross-examination is most probably based upon contrary medical interpretation of the objective facts known to all. A refusal to tolerate or to recognize a contrary view will not be in the best interests of the administration of justice.

B. *Medical Testimony.*—A physician should bring with him to court all his records with repect to the patient about whom he is testifiyng and may request that the hospital records with respect to such patient also be present in court. A lawyer should not counsel against the production of such records. When preparing to testify or when testifying a physician may examine such records to refresh his recollection. Once he has used them for such purpose, the lawyer for the opposing party may examine them too.

The qualification of a medical witness involves an inquiry into his medical education, post graduate training and research and his membership in various medical organizations. The physician should be prepared to give a résumé of these professional qualifications without hesitation but without undue elaboration.

In the giving of testimony, the physician under no circumstances should permit any bias, prejudice, favoritism or personal interest to influence or affect his testimony. If the physician is asked a question to which he does not know the answer, he should so state and make no attempt to speculate or guess or theorize or give answers not responsive to the question propounded. A physician should not hesitate to express his opinions which are based upon a reasonable medical certainty. The medical witness is not required to exclude all doubts from his mind but may render his testimony as an opinion couched in expressions which fall short of an absolute conviction of accuracy. Simply because someone else might not agree with his opinions should not cause the physician to hesitate in expressing them. He must also remember that it is only fair that a contrary interpretation of the medical facts may exist and may be admitted. The physician must state his opinion if he has one. However, if he feels he is not qualified to give one, he should so state, and if he has no opinion he cannot be compelled to give one.

Trials are conducted according to rules of evidence and a physician may find that frequently during the presenting of his testimony there will be objections. These objections by the lawyers are merely a request to the court to pass upon the materiality, the relevancy, or the competence of the testimony being offered. The court will rule according to the rules of evidence and the decision will be made as to whether the testimony should be considered along with other evidence in the case. The physician should not feel frustrated by these frequent interruptions since they are important and essential to protect the relative rights of the clients who are litigants.

It is frequently necessary to use hypothetical questions in illiciting testimony from medical witnesses. Such questions can be lengthy, troublesome and confusing if not properly prepared and presented. It is the lawyer's obligation to present such questions so as to be free from ambiguities and to eliminate any possible misunderstandings. The medical witness in attempting to answer the question, must, of course, be sure that he understands all of its elements and that they are sufficient and complete enough so that he can properly predicate his opinion thereon.

C. *Ethical Limits of Medical Testimony.*—It is a rare occasion when intentional false or improper medical testimony is given in the trial of a case. However, it has occurred. Similarly, there are occasions when lawyers exceed the limits of pro-

priety and attempt to introduce improper medical testimony or attempt to influence the testimony of the medical witness.

Each of the members of both professions has a duty to satisfy himself as a matter of conscience and professional judgment that the person doing so has exceeded the limits of ethical medical testimony or ethical handling of medical witnesses and once doing so has the obligation of reporting such activity to the appropriate organization within the profession which is set up to handle such matters.

The reputation of a professional person is his most precious and valuable asset. Therefore, the reporting of such improprieties against a member of one's own profession or against the member of another profession is a matter of great seriousness and calls for a high degree of discretion. It must be remembered that in an area such as medical testimony, there is a large degree of variance in opinions and in most cases these opinions are based upon sound medical authority. The possibility of unintentional misstatements or representations also must be considered. Therefore, before any action is taken of any kind, the person doing so must be absolutely certain in his own mind and conscience that such action is warranted.

Conversely, it is just as serious to abstain from reporting such misconduct as it is to make a groundless charge. Therefore, when a member of either profession becomes convinced that such misconduct has occurred, it is his duty to report it.

III. Compensation of Medical Expert

A. *Medical Fees*

1. *Contingent Fees.*—It is improper for the lawyer and the physician, whether he be an attending physician or an examining physician, to enter into any arrangement making the payment of medical fees, or the amount thereof, contingent upon the outcome of the litigation. Fixed fees should be established prior to the examination or court appearance.

2. *Attending Physician.*—The expense of care and treatment of the patient is the obligation of the patient, irrespective of the litigation or the outcome thereof. The expense, if any, for preparation of medical reports for use by the patient's lawyer is the obligation of the patient. The expense of court appearance or preparation therefor is the obligation of the patient. The lawyer for the patient is under no legal obligation to pay such fees.

It is improper for the attending physician to insist, as a condition precedent to his testimony, that the lawyer for the patient guarantee payment of an unpaid bill for medical services, or bills for services to be incurred for the court appearance.

3. *Examining Physician.*—The expense of an examination and report by an examining physician, as well as x-ray expense and similar costs necessary for a complete examination, are obligations in the first instance of the lawyer requesting the same. Similarly, the expense of court appearance is an obligation in the first instance of the lawyer requesting the same. This fact does not relieve the client of his ultimate liability to pay the examining physician or reimburse his lawyer.

It is proper and desirable practice that whenever a lawyer refers a client to a physician for examination he should do so in writing, stating the terms of the reference. If the lawyer disclaims liability for the fee or if the physician doubts the lawyer's credit, the physician may be justified in withholding his report until the fee is paid or in declining to testify until mutually satisfactory financial arrangements have been made.

Payment of the examining physician's fees should be made promptly upon completion of his services. Delay in the final disposition, such as appellate procedure, is not sufficient reason for a lawyer to delay payment.

4. *Court Appearances.*—The lawyer and his client should realize that a physician's fee for a court appearance is based upon many factors among which are not only actual time away from office but also stand-by time—i.e., the hours for which the physician has not been able to arrange a normal schedule of appointments either because he does not know exactly when he must appear in court or because he does not know exactly when he will return from court. They should also recognize that a physician is entitled to charge a fee for a court appearance if a case is settled while he is in the courtroom or if he has incurred stand-by time even though in either case he has not testified.

B. *Professional Obligation of Attorney to Protect Physician for Fees on Services Rendered.*—

In the event of recovery, the lawyer has an obligation to use all reasonable measures to assure payment by the client of the statement for services of the attending physicians, not only for the court appearance but also for services rendered. Whenever possible, unpaid statements should be satisfied as part of the process of distributing funds recovered in the litigation. A lawyer unable to make arrangements for satisfaction of unpaid medical bills should promptly notify the physician of such facts.

INTERPROFESSIONAL UNDERSTANDING

This code of interprofessional relations has been designed to promote better understanding between physicians and lawyers. If it is studied carefully and followed diligently by members of both professions, it should go far to eliminate the frictions that have arisen and to enhance the areas of understanding. Improvement of the relationships between the two professions will enable the two professions to progress together in their service to humanity and its individual ills, whether of body, of mind, or to rights guaranteed under our system of justice.

History of Medicine in Minnesota

PIONEER PHYSICIANS OF STEVENS COUNTY, MINNESOTA

JOSEPHINE EDDY, GRACE HALL,
A. I. ARNESON, M.D.
Morris, Minnesota

ROBERT ROSENTHAL, M.D.
Saint Paul, Minnesota

(Continued from January 1960 issue)

Dr. William M. Ray started to practice medicine in Morris in January, 1879, opening his office at the Perkins House. His professional card appeared in the Morris newspaper from February, 1879, to October, 1881. It seems he alternated between Morris, Stevens County, and Benson, Swift County; at least, in March and April of 1879 he seemed to be staying in Benson and came to Morris only when needed. In October, 1880, the local paper states that he planned to locate permanently in Morris.

A news item of November 10, 1881, tells that Dr. Ray had left for Cokato, Wright County. He is, no doubt, identical with the Dr. Ray who practiced in Delano from 1883 through 1887.**

Dr. Ray graduated from the Missouri Medical College, St. Louis, Missouri, in 1868 and came in that year to Chaska, Scott County.† He left there after five months and went to St. Paul, which he left after a very short stay, late in 1868, to go to Glasgow, Missouri. It is not known whether he stayed there until his appearance in Stevens County in 1879.

It is also not certain, but probable, that he is the same Dr. William Ray who practiced in Otter Tail County in the 1880's; if so he must have moved there very late in that decade and practiced several years at Pelican Rapids and later in Fergus Falls, leaving Fergus Falls in 1904 for Phillipburg, Montana.

He seems to have been an active practitioner who left his mark in Wright County where he was a charter member of the Crow River Valley Medical Society in 1883 and was one of the authors and signers of the the signers of the articles and by-laws of this first medical society of Wright County. He was licensed in Minnesota on December 21, 1883.

It is difficult to understand why he was such a rolling stone, although he has been described as a jovial personality. He was at least four years in Delano, Wright County, and was not too successful in establishing a satisfactory practice there.

Dr. Stephen (Steve) H. Spurr "has decided to cast his lot with the people of Stevens County and has opened his office in the Spooner Block" states the *Mor-*

**Unpublished medical history of Wright County.

†"History of Medicine in Scott and Carver Counties," MINNESOTA MEDICINE, 31:798 (July) 1948.

ris Tribune of May 6, 1896. After three years in Morris,‡ he got into trouble with the law for an alleged abortion. A warrant was sworn out by Dr. E. W. Young for his arrest and that of another man on the charge of performing the abortion and trying to buy off the complaining witness with money and even an offer of marriage. There was action to have Dr. Spurr's license revoked. The doctor, whose father, N. R. Spurr, had been county auditor of Stevens County for many years, was cleared by the grand jury although the case was played up in the newspapers.

Immediately after this incident, he left Morris and went to St. Paul, where he studied dentistry. He did not practice medicine there but was called before the grand jury several times because of "immoral practices," without ever being indicted.

Dr. Spurr was a graduate of the College of Homeopathic Medicine and Surgery at the University of Minnesota in 1893 and was licensed on April 7 of the same year. Before coming to Morris in 1896, he practiced in Michigan and in Herman (Grant County), Appleton (Swift County) and Granite Falls (Yellow Medicine County), Minnesota§, though it seems that he had located for a while in Morris before he moved to Appleton around the first of November, 1895.

Dr. Spurr was born in Maine on October 10, 1871. He died suddenly, in the Globe Building in St. Paul on April 27, 1928, due to chronic myocarditis*, at the age of fifty-six and was buried in Forest Cemetery in St. Paul. He was survived by his wife, Edna. Dr. Spurr had lived in St. Paul for twenty-eight years.

Dr. Douglas R. Sutherland was born at Poughkeepsie, Dutchess County, New York, on Nov. 9, 1852, the son of Walter and Julia Sutherland.

Dr. Sutherland received his primary education in the state of New York and in 1869 matriculated at Yale College. He studied at Yale for two years, but, because of failing health, was compelled to discontinue his studies there. For a year he studied medicine at home, then entered Columbia College of Physicians and Surgeons from which he was graduated in 1874.

In December, 1873, he married Pauline Doty. Three children were born to this union, Essie, Mae and Douglas.

He opened an office in Poughkeepsie, New York, and continued to practice there for five years, with the exception of one year spent in the South for his health. In 1879 he came to Stevens County where he resided until the time of his death.

In appearance Dr. Sutherland was of medium size and, when he first came to Stevens County he wore "mutton-chop" whiskers. Later he was smooth-shaven. His manner was somewhat distant, especially among strangers. He made his calls to his patients and his trips around his farm on horseback at first, later using a top-buggy and horses.

When Dr. Sutherland came to Stevens County, he located on a three thousand acre farm lying in the townships of Morris and Darnen and commenced farming on an extensive scale, cultivating one thousand and ten acres. He remained on the farm some five years and then traded it for Minneapolis property.

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‡*Morris Tribune,* July 22, 1899.

§His stay in Granite Falls could not be verified, and the excellent "Medical History of the County of Yellow Medicine" by Mildred B. Lee, MINNESOTA MEDICINE, June, 1953-May, 1954, does not mention him.

*There was a rumor that he committed suicide. This probably originated because the coroner, Dr. Ingerson, was called in on this case of sudden death.

He then moved to the village of Morris and for two years was connected with the First National Bank as vice president and president, after which he sold out his interest in the banking business and became occupied in the practice of his profession. In the files of the present Arneson Drug Store prescription No. 2 was signed by Dr. D. R. Sutherland.

In 1880, Dr. Sutherland erected an elevator at Morris and operated it under the firm name of D. R. Sutherland and Co. for three or four years. In 1881 the same firm put up an elevator at Donnelly, which they operated until its destruction by fire in 1883. Also, in 1880, he laid out the Sutherland Addition in the village of Morris and built a beautiful home there.

Dr. Sutherland was one of the most public-spirited, prominent and influential citizens in this part of the state. He was a member of Golden Sheaf Lodge, No. 132 A.F. and A.M., Mt. Lebanon Chapter No. 47, R.A.M.; Bethel Commandery No. 19, Knights Templar, Minneapolis Consistory, No. 2; and Zuhrah Temple of Minneapolis. He was Eminent Commander of the Commandery, and was one of the officers of the Grand Commandery of the state. He was also a member of the Odd Fellows fraternity and of the Encampment.

Dr. Sutherland was active in many community affairs. An item in the local paper June 26, 1884, states: "In Fourth of July program Dr. D. R. Sutherland is listed as Marshall of the Day. For such occasions he dressed in his Masonic uniform with black hat, a long white feather going from front to back; a long coat decorated with gold cord and white lace trimmings. He rode horseback and made a very imposing figure." He was president of the local school board for several years, a warden in the Episcopal Church, a commissioner on bridges on Toqua Road, president of the Stevens County Agricultural Society and president of the Board of Trade in 1882. He was Stevens County coroner (elected on the Republican ticket), director of the library and reading room, and was county health officer for many years.

Dr. Sutherland enjoyed hunting and was president of the Sportsman's Club in Morris.

No man in the county was more widely or more favorably known. His extensive property interests and his active business life, together with his energy, enterprise and business ability, have connected his name indissolubly with the history of the growth and development of this part of the state.

Dr. Sutherland's obituary appeared in the *Morris Tribune*, April 29, 1896.

"Eminent Physician Gone.—Dr. D. R. Sutherland died on Arbor Day after just one week's sickness of pneumonia. The angel of death descended once more in our midst and picked out one of our noblest men; a man who had administered to the cares of the sick and needy for the past twenty-two years; a man who was beloved by all who knew him, and a man whose ambitious desires carried him to the top of fame in his profession, being acknowledged one of the best physicians and surgeons in the state of Minnesota. He contracted pneumonia while visiting patients through that awful damp and chilly weather a couple of weeks ago and was taken to his bed on the 17th. Everything that skill and science could do was done, but without avail. He gradually sank from the beginning, until the 24th when he breathed his last in this world of care and trouble surrounded by a heart broken family. Dr. Wheaton of St. Paul, Dr. Jones of Minneapolis, Dr. Hand of Litchfield were constantly by his side during the last of his sickness, and were doing all that human hands could do. His remains were taken to Litchfield for interment."

On the same date the following item appeared in the paper: "Mrs. D. R. Sutherland, her daughter, Mae, and son, Douglas, left today for Litchfield where they will make their future home. The loss of Mrs. Sutherland and Mae will be keenly felt by Morris society, as they were prominent among the leaders." Later Mrs. Sutherland and children moved to Kansas City, Missouri.

A Dr. Thomas and his wife, who was also a physician, came to Chokio shortly after the turn of the century. They had a daughter, Jennie. This is all the information available about them.**

Dr. F. C. Trumpour was born May 5, 1870, in Prince Edwards County, Ontario, Canada. He received his education in Canada. In 1891 he was graduated from the Medical Department of Toronto University where he took a three years' course in classics and science and a five year medical course. Besides this, he took a special course in surgery and secured the degree of Master of Surgery as well as that of M.D. He also graduated from the College of Pharmacy. He was constantly abreast with the advancement of new ideas in medicine and surgery. He possessed a multiple nebular vaporizer which, in 1898, was new for treatment of lung, throat and nose.

After graduation, Dr. Trumpour went into partnership with Dr. B. W. Randall in hospital service in Toronto. He then located in Elgin, Iowa, where he remained two years. From there he went to Graceville, Big Stone County, where he spent three years.†

Dr. Trumpour came to Morris, June 8, 1897, from Graceville, and opened offices formerly occupied by Dr. Sutherland. In June, 1898, he moved his office to rooms over Larson's drugstore.

In appearance Dr. Trumpour was of medium height and build and had a dark complexion.

In July, 1897, Dr. Trumpour was appointed regular physician for the government school. There were forty-five Indian children there at the time, eight of whom had the measles.

In December of the same year, Dr. Trumpour caught a cold which developed into pneumonia. This proved fatal and he passed away at his home Dec. 18, 1898. The following obituary appeared in the local paper Dec. 24, 1898:

"Sad Harvest of Death. Dr. Trumpour Passes Away.—The death of Dr. F. C. Trumpour came as a severe shock to the people of Morris last Saturday. All knew that the doctor had been suffering from an attack of inflammatory rheumatism and that he had also contracted pneumonia, but word had gone out that the doctor had safely passed the crisis of the disease, so that the sudden announcement of his death came with double force. Dr. Trumpour had been in Morris only a year and a half, yet in that time he had so endeared himself to a large circle of friends by his self-sacrifice in the practice of his profession that his death will be lamented by his friends as the loss of an own relative might be.

The abundant sympathy which is now being expressed for Mrs. Trumpour is but an estimation in which the doctor and his bereaved wife are held by the people of Morris—the former from the fact that every patient he ever had felt that in him they had a friend whose sole aim in his profession appeared to be the care of his patients, the latter for those qualities of womanly virture which made her a queen in her home—a faithful wife and an endearing friend."

Dr. F. C. Trumpour and Gertrude Tennant were married on June 2, 1892, at Brockville, Canada. She and their three children, Mildred Lucille, Traverse Tennant, and Helen Gertrude, survived him and apparently returned to Canada with her parents.

**Communication of Mrs. Oden L. Henry. (March 6, 1956)

†It is said that the partnership with Dr. Randall was dissolved in 1895, but this probably is incorrect. If he really practiced five years in these two towns, he must have left Toronto in 1892.

Dr. E. R. Wait‡ was the first physician in Stevens County of whom a definite record could be found. The *Frontier Business* of August 11, 1876, printed his professional card, "Dr. E. R. Wait, physician and surgeon, Refers. by permission to Drs. Murphy, Wharton and Hand of St. Paul. Office at Central House, Morris, Minn." Dr. Wait must have come to Morris earlier than the date of the card indicates, because, when he left the county in the same month (the newspaper stated on August 18, 1876, that he was gone), he had been well established and was very popular. He was long remembered for his use of sulphur and molasses in spring and some concoction which he used as a cure-all and which he advertised to a considerable extent. His place in Morris was taken by Dr. W. E. Holden in the spring of 1877.

Although nothing is known of his medical background, it seems he must have had a pretty good training as his association or acquaintance with Drs. Murphy, Wharton and Hand, three of St. Paul's outstanding physicians of that period indicates§. Another indication is the fact that he was elected to membership in the Ramsey County Medical Society in May, 1874, and only a month later was made secretary and re-elected to this position in October of that year; he also became a member of the executive committee.

Dr. Wait left St. Paul late in 1874 or early 1875. He may have then moved to Morris. When he left Morris, he was a very sick man with affected lungs resulting in hemorrhages; he returned to St. Paul and there was justified fear that he would not come back to Morris.

Dr. E. W. Young came to Morris in December of 1898 from Barrett, Grant Co., Minn.

In appearance, at that time, the doctor was stockily built, and of fair complexion. He was of middle age when coming to Morris, although comparatively young in the general practice of medicine.

Dr. Young was graduated with a bachelor of arts degree from Carleton College in 1879 and immediately went into school work. For many years he taught with success, but meanwhile read medicine. He was graduated from the Medical Department, Hamline University, in 1896, and was licensed on April 14 of the same year. After his medical education was completed, he was for many years a member of the faculty of College of Physicians and Surgeons in Minneapolis.

The following item was published in the *Barrett Lake Breeze* on Jan. 7, 1899:

"Complimentary to Dr. Young.—Dr. Young departed Tuesday for Morris where he has decided to locate—as we stated in last week's *Breeze*, Barrett can ill afford to part with the doctor, and his loss will be felt by all. During his residence of but one short year in this village, Dr. Young has made a host of friends, and it is to be regretted that the practice he has acquired did not warrant his remaining. He has identified himself with every commendable understanding in the village, was a conspicious factor in all religious and social affairs, and the *Breeze* unhesitatingly commends to the people of Morris and vicinity a gentleman of true merit and a physician of much ability. Mrs. Young and children will remain here until a suitable place of abode can be obtained in Morris."

Dr. Young practiced in Stevens County only until January, 1900, when he was appointed surgeon for the Minneapolis Iron Works, which employed hundreds of men.

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‡His first name apparently was Edson.

§It is known that he studied in the office of Dr. John Henry Murphy.

In the January 6, 1900 issue of the *Morris Tribune,* Dr. Young's departure was noted with regret as the doctor and his family had made many friends. It was Dr. Young who swore out the warrant for the arrest of Dr. S. H. Spurr, accused of performing an abortion. According to the newspaper story (July 22, 1899), "Dr. Young was offered a certain amount of pecuniary remuneration in case the prosecution was not pushed. This offer was made before the warrant was sworn out. Dr. Young, of course, would not enrich himself by any such criminal means." There is reason to believe that Dr. Young's practice was not too successful in Morris; one of the indications is the fact that he tried to broaden his area of practice by making arrangements in October, 1899, for regular visits in Cyrus, Pope County.

ADEQUATE MEDICAL CARE GREATLY REDUCES HAZARDS OF SERIOUS SURGERY IN AGED

Older people today can "withstand serious surgery almost as well as the young" provided pre-operative preparation is adequate, according to Dr. Edward E. Jemerin of the Mount Sinai Hospital, New York, in an article in the March, 1960, issue of the *Journal of the American Geriatrics Society.*

Noting that the need for surgery in the aged has paralleled the increase in our aging population, he asserts that "the contraindications of a few years ago are being neutralized to such a degree that it is now rarely necessary to withhold indicated surgery in the aged."

He stresses, however, that emergency surgery in the aged should, wherever possible, be avoided because careful pre-operative preparation is vitally important. Some of the important pre-operative steps listed by Dr. Jemerin include the following:

The patient should be admitted well in advance of the operation;

He should be given a complete physical examination and imbalances or disease states such as diabetes or heart failure should be treated;

If the patient is debilitated, testosterone is "often beneficial," and adrenal steroids may improve operability in conditions "which may have taken their toll of the adrenal capacity to respond;"

Existing infection should be "treated vigorously because of the patient's low resistance."

As far as emergencies are concerned, multiple-stage procedures are sometimes advisable, in order to convert emergencies into elective procedures "with their appreciably lower mortality," Dr. Jemerin says. Too, prophylactic surgery may prevent emergencies.

Dr. Jemerin also stresses the importance of post-operative care to avoid complications.

The incidence of such complications is high, he adds, with pulmonary ones ranking as the most frequent. Causes of death in order of frequency are cardiac, pneumonic, infectious, embolic and renal.

Adequate post-operative care, Dr. Jemerin says, includes making sure that the patient obtains adequate pulmonary ventilation by getting him to move frequently in his bed; getting him on his feet as soon as possible; instituting early active and passive exercises to prevent blood clots; and using hormones and antibiotics as indicated.

Minnesota Blue Shield

Minnesota Blue Shield has purchased a three-story building at 2218 University Avenue, St. Paul, which will be the organization's new home, following alterations and remodeling of the interior and exterior.

The three floors plus basement will provide an area of approximately 24,000-square feet.

The purchase was approved at a meeting of the Blue Shield Board of Directors, February 26, 1960.

Since 1951, Blue Shield has maintained headquarters in the Blue Cross building at 2610 University Avenue, St. Paul.

IBM high-speed data-processing equipment has been leased by Blue Shield and will be installed at the new location to handle all accounting, billing, and record-keeping operations. James Shobe, St. Paul, formerly on the staff of International Tabulating Company, has been appointed head of Blue Shield's data processing division.

Dr. C. A. McKinlay, president of Minnesota Medical Service, Inc., said, "The new headquarters will give Blue Shield a less expensive yet completely adequate home. It will house complete facilities for claims processing, accounting and billing and will be sales headquarters for the Blue Shield division of Enrollment and Service, operating through its appointed representatives in the field."

In addition, a regional office of the Division of Enrollment and service has been established at 501 Providence Building, Duluth, Minnesota.

* * *

During 1959, Minnesota Blue Shield paid a total of $10,197,592.98, or nearly $850,000 a month, in surgical-medical service expenses for its subscribers, setting a new record and raising the total payments since the plan began in 1947 to nearly $61,000,000.

The 1959 payments were about 5.3 per cent greater than the 1958 figure of $9,686,819.04.

The number of services paid for also rose to a new high of 395,696, compared with 365,654 in 1958.

Principal categories of services paid for 1959 included: 23,237 obstetrical care; 70,749 skin surgery, other than suture of wounds; 16,326 suture of wounds; 26,285 surgical care of bones, joints, and tendons; 10,217 endoscopic procedures; 3,508 neuro-surgery; 3,735 proctology; and 8,664 tonsillectomies.

On December 31, 1959, there were 333,779 Blue Shield contracts in force, covering 865,833 participants. These included 290,194 contracts under Plan "A" with 758,878 participants; 42,254 contracts under Plan "B" with 105,624 participants; and 1,331 Senior Citizens contracts.

The new diagnostic x-ray and laboratory coverage, which is being added to all contracts on their anniversary dates, was, by the end of 1959, extended to 292,572 persons under Plans "A" and "B".

Included in operating expenses were service charges paid to Blue Cross of $983,449.45.

The record total of $10,197,592.98 paid out by Blue Shield for surgical-medical services expenses represented 86.6 per cent of the year's receipts of subscriber's payments. From the balance, the sum of $217,363.04 was transferred to Blue Shield's reserve for future medical, maternity and surgical care and contingencies, and $200,000 was set aside to meet unreported cases. This addition makes the present total set aside for unreported cases of $1,650,000.

* * *

The Minnesota Radiological Society at its winter meeting in St. Paul, March 5, unanimously adopted a resolution commending Minnesota Blue Shield's extension of coverage to include diagnostic x-ray provided on an out-patient basis.

The resolution referred to the Blue Shield addition of benefits for diagnostic x-ray and laboratory services rendered by doctors of medicine in the doctor's office, the patient's home or the out-patient department of the hospital when necessary to diagnose an illness or injury.

These benefits have been, or are being, added to all Blue Shield contracts. The subscriber's identification card will indicate whether his diagnostic coverage is in effect.

The action by the Radiological Society was one of a number of resolutions endorsing the Blue Shield diagnostic plan which have been adopted by medical societies throughout the state in recent months.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

INTRODUCE "HOW'S YOUR HEALTH?" TO YOUR NEWSPAPER EDITOR

Each week nearly 650 Minnesota daily, county and suburban weekly and semi-weekly newspapers receive the health column "How's Your Health?" In addition, more than fifty Minnesota radio and television stations are on the regular mailing list of the weekly health feature produced by the Public Health Education Committee of the Minnesota State Medical Association.

Titles of columns released during January and February of 1960 include the following: "A Periodic Checkup is Your Health Inventory"; "Ulcer Prevention Fundamentals Explained"; "Mouth Sores Tell a Story of Health"; "ABC's of Eye Care Explained"; "Steps Listed For Saving Child from Plastic Suffocation"; "Heart Attack Patient Profile Given"; "Food Likes—Dislikes Reveal Personality Traits"; and "False Myths Cloud Facts of Life."

Eight Minnesota newspapers have used all columns released to date in 1960. They are: *Blue Earth Register, Butterfield Advocate, Hutchinson Leader, Minneapolis Progress-Register, Pierz Journal, Waseca Journal, Watertown News* and the *Winsted Journal.*

Individual physicians and county medical societies may wish to introduce this health information service to newspapers not yet using the "How's Your Health" series.

Some of the newspapers which print "How's Your Health," do so as a column, others print the material as a straight news story.

Interested editors should be advised to look for "How's Your Health" in the weekly packet of news releases mailed to all members of the Minnesota Editorial Association.

Sample copies will be mailed from the Minnesota State Medical Association offices upon request.

TV VIEWERS SEE "WHAT'S IN THE DOCTOR'S BAG"

Television viewers in the Twin City area had the opportunity on the evening of February 11, of discovering just what really is in the doctor's bag. Dr. Robert Semsch and Dr. James Rogers Fox, both members of the Public Health Education Committee of the Minnesota State Medical Association appeared on the program. The participants presented an informal explanation of the use and purpose of the most common diagnostic instruments found in the doctor's bag. A fully equipped physician's bag was furnished by Physicians and Hospitals Supply Company, Minneapolis. Other properties used in the production of the show were furnished by the University of Minnesota Hospitals, Minneapolis, the Veterans Administration Hospital, the Minnesota Heart Association and the American Medical Association. At the conclusion of the show, Family Health Records were offered to the television audience.

CLINICAL MEETING FILM AVAILABLE

The 13th Clinical Meeting of the American Medical Association in Dallas, December 1-4, 1959, can be brought back to life on your movie screen.

Some of the important scientific developments presented at the meeting have been preserved on a 16mm sound film which is now available to you and your program chairman.

Selected highlights of the lectures, exhibits and discussions make an informative

twenty-five-minute motion picture. Dr. Oscar Auerbach is seen during an interview on his widely discussed study, linking smoking and lung cancer. Dr. Hubertus Strughold gives his views on medicine and man in space, and, on the lighter side, there is an amusing look at turn-of-the-century medical journals and vintage cars.

For the physician who attended the meeting, the film gives an overall view of the happenings and will recall significant points and bring back many pleasant memories. For those who were unable to attend, the film offers a way to bring the meeting in capsule form to them and to provide a sense of actual participation.

In brief, the film offers an excellent opportunity for physicians to learn more about the variety of scientific subjects discussed during this outstanding scientific program.

This motion picture, produced by Fordel Films of New York for the Schering Corporation and the American Medical Association, was designed to be shown during state and county medical society meetings and at hospital staff meetings.

You can reserve your copy for your next meeting by writing to the Film Library, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois. Your only expense is the return postage on the film.

"REHABILITATION ADDS LIFE TO YEARS"

A new and timely scientific motion picture prepared by the American Medical Association—points up the role of the physician in initiating and directing community rehabilitation programs.

Actual case histories dramatically illustrate various types of rehabilitation problems met by physicians in practice—the hemoplegic housewife . . . the factory worker with the injured hand . . . the coronary victim.

Emotional, social and economic factors surrounding a patient's disability must be looked after as much as his mental and physical needs. Because of this, local medical societies should list the services available in the community. Such services include convalescent homes, employment groups, visiting nurses, social agencies, protective workshops, speech clinics, vocational guidance groups, hobby and handicraft clubs, and so on.

"Rehabilitation Adds Life To Years" was developed by the Committee on Rehabilitation, American Medical Association, to stimulate physician interest in total patient care. Plan today to show this thirty minute, color, sound film at local medical society and hospital staff meetings. Know the rehabilitation services in your area. Under your direction, rehabilitation programs can play a vital role in the lives of your disabled patients.

Available (for return postage only) from the Film Library, American Medical Association, 535 North Dearborn Street, Chicago 10, Illinois.

INFLATION HITS COST OF LETTER WRITING

The cost of business letters has risen. The current estimate is $2.00 per letter. With this knowledge at hand, many physicians may wish to re-evaluate their business letter writing habits. A number of authorities in the art of business letter writing now recommend the adoption of a style which comes more quickly to the point, in shorter letters, less formal in nature. The following ten-point plan for business letter improvement was suggested in the April 1959 issue of *Office Executive* magazine.

1. *Learn* to write by doing. . . . Get plenty of directed writing practice. . . . 2. *Try* to write in a conversational tone—but don't ramble. . . . 3. *Forget* useless and out-moded business jargon and write naturally. . . . 4. *Get* a good reference book on writing (we recommend "Ten Commandments for Writing Letters that Get Results" by Donald R. Roberts of Western Girl Inc., and John P. Riebel—$6.00—Ask for it at your book store.)

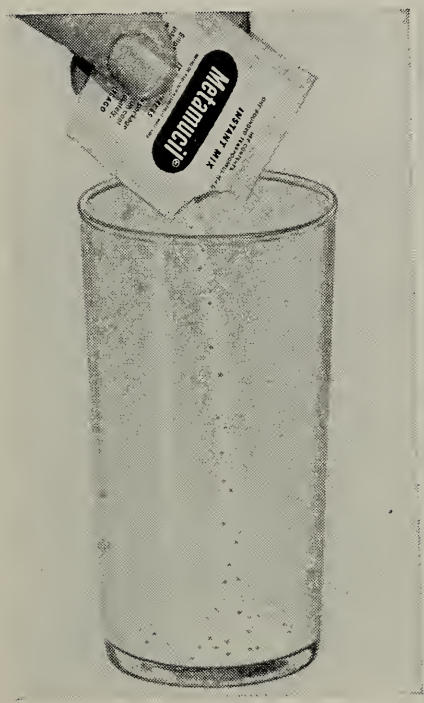
5. *Review* the fundamentals of good English. Find out what constitutes a good sentence and aim to upgrade your vocabulary. . . . 6. *Organize* your thoughts before writing. 7. *After* you have written something, analyze it and then rewrite it. . . . 8. *Periodically* audit the letters you have written to see whether you can improve your writing pattern. . . . 9. *Ask* someone else to criticize your letters. Another person can spot your errors more easily than you. . . . 10. *Try* a simple do-it-yourself test. . . . Read your letters aloud to determine whether they are really YOU who are talking in them.

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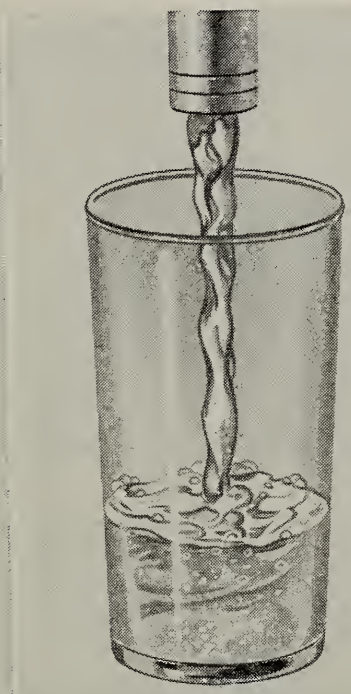
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Communications

VETERANS ADMINISTRATION-MEDICAL SCHOOL RELATIONSHIPS

The AAMC Committee on Veterans Administration-Medical School Relationships recently requested the deans of the United States medical schools to fill out a questionnaire on the extent of current use of and projected needs for Veterans Administration Hospitals by medical schools in their educational and research programs. Each of the 82 four-year medical schools replied. It was found that 71 medical schools participate by means of the Dean's Committee in the operation of 96 VA hospitals.

To what extent are the VA hospitals used for undergraduate education? The data from the questionnaire on this point are summarized in Table I.

In the area of graduate medical education, it was found that 67 VA hospitals participate in residency training programs which include a total of 1,381 positions: 467 of these positions connected with 44 medical schools are in the area of medicine; 561 positions connected with 52 schools are in surgery; 150 positions connected with 27 schools are in psychiatry; and 203 positions connected with 32 schools are in other clinical areas.

One of the problems which impedes the utilization of certain VA hospitals for medical education is geographical distance from the medical school. The usable data on this point indicates that 33 hospitals, or 38.4% of the VA hospitals are adjacent to the medical school using their facilities; twenty-seven (31.4%) of the VA hospitals are within fifteen minutes by car from the medical school; and twenty-six (30.2%) of the total are more than fifteen minutes travel by car from their respective medical schools.

Finally, the Committee was interested in learning the value of the VA hospitals to the medical schools. First, the deans of the medical schools were asked to rate the value of the VA hospitals they worked with to the medical schools' various programs. The results are indicated in Table II.

A second way in which the deans estimated the value of the VA hospitals to the medical school pro-

(Continued on Page A-60)

> This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

TABLE I. LENGTH OF TIME AND NUMBER OF MEDICAL STUDENTS RECEIVING INSTRUCTION IN VA HOSPITALS

Discipline	2nd Year			3rd Year			4th Year		
	Number of Schools Participating	Average Number of Students Per School	Average Number of Days in Hospital Per Student	Number of Schools	Average Number of Students	Average Number of Days in Hospital	Number of Schools	Average Number of Students	Average Number of Days in Hospital
Medicine	4	31	24.5	40	54	43.2	27	44	32.6
Surgery	1	16	4.0	31	60	38.8	30	41	30.7
Psychiatry	1	50	4.0	16	62	21.4	12	42	21.0
Physical Diagnosis	39	52	15.0	3	48	22.7	2	66	22.0
Other	1	90	1.0	9	65	9.1	12	50	12.9

TABLE II. VALUE OF VA HOSPITAL TO MEDICAL SCHOOLS' TEACHING PROGRAMS

Rating of Value of VA Hospital to Medical School Program	Undergraduate Medical Education		Research		Residency Training		Other	
	Number of Hospitals Involved	Per Cent	Number of Hospitals Involved	Per Cent	Number of Hospitals Involved	Per Cent	Number of Hospitals Involved	Per Cent
1. Essential	24	26.7	9	11.3	20	24.1	2	22.2
2. Desirable	38	42.2	48	60.0	46	55.4	4	44.4
3. Not essential	28	31.1	23	28.7	17	20.5	3	33.4
	90	100.0	80	100.0	83	100.0	9	100.0

as it calms anxiety!

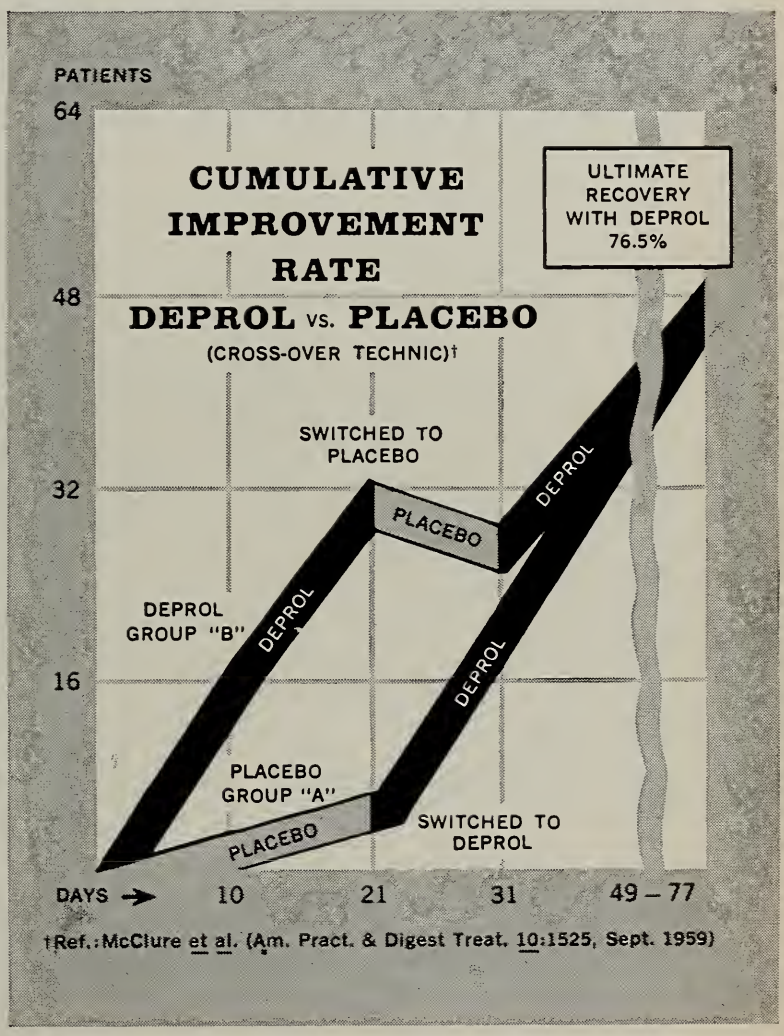
Smooth, balanced action lifts depression as it calms anxiety... rapidly and safely

alances the mood – no "seesaw" effect of amphetamine-barbiturates and energizers. While amphetamines and energizers may stimulate the tient – *they often aggravate anxiety and nsion.* And although amphetamine-barbiturate mbinations may counteract excessive stimula-on – *they often deepen depression.*

contrast to such "seesaw" effects, Deprol lifts pression as it calms anxiety – both at the same me.

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†Ref.: McClure et al. (Am. Pract. & Digest Treat. 10:1525, Sept. 1959)

BIBLIOGRAPHY *(11 clinical studies, 764 patients):*

1. Alexander, L. (35 patients): Chemotherapy of depressian – Use af meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 1958. **2.** Bateman, J. C. and Carlton, H. N. (50 patients): Meprobamate and benactyzine hydrochloride (Deprol) as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy 6:648, Nov. 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulita, F. (77 patients): Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** Breitner, C. (31 patients): On mental depressions. Dis. Nerv. System 20:142, (Section Twa), May 1959. **5.** Landman, M. E. (50 patients): Choosing the right drug for the patient. Submitted for publication, 1960. **6.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Woad, C. A. and Ceresia, G. B. (128 patients): Treatment of depressian–New technics and therapy. Am. Pract. & Digest Treat. 10:1525, Sept. 1959. **7.** Pennington, V. M. (135 patients): Meprobamate-benactyzine (Depral) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **8.** Rickels, K. and Ewing, J. H. (35 patients): Deprol in depressive conditions. Dis. Nerv. System 20:364, (Sectian One), Aug. 1959. **9.** Ruchwarger, A. (87 patients): Use of Depral (meprobamate combined with benactyzine hydrochlaride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **10.** Settel, E. (52 patients): Treatment of depression in the elderly with a meprabamate-benactyzine hydrochloride combination (Deprol). Antibiotic Med. & Clin. Therapy 7:28, Jan. 1960. **11.** Splitter, S. R. (84 patients): The care af the anxiaus and the depressed. Submitted far publicatian, 1959.

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Composition: 1 mg. 2-diethylaminoethyl benzilate hydrochloride (benactyzine HCl) and 400 mg. meprobamate.

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1519

VETERANS ADMINISTRATION-MEDICAL SCHOOL RELATIONSHIPS

(Continued from Page A-56)

grams was in terms of replacement cost. The data indicated that 351 additional staff members would be needed in the medical school faculties; $1,997,500 additional funds would be needed in medical school budgets; and facilities for 15,850 out-patient visits per year and 4,395 beds for in-patients would be needed if VA hospitals were not available for use in the various programs of medical education.

It would appear from these data that it is the judgment of the deans of American medical schools that the Veterans Administration Hospitals comprise an important segment of the facilities which are currently used to carry on medical education in the United States.

ASSOCIATION OF AMERICAN
MEDICAL COLLEGES

DOCTOR-HOSPITAL ADMINISTRATOR RELATIONSHIP

Admiral Rickover's conception *(Saturday Evening Post,* February 13) of Doctor-Hospital Administrator relationship is ideal. Would that this were practiced.

Hospital administration, like any administrative organization, obeys Parkinson's first law* This is clearly illustrated, although transparently disguised, in the article "The Patient Gets a Break" *(Post,* January 2).

To wit:

1. Mr. Carl Ave'Lallemant speaks of "his patients." Mr. Ave'Lallemant is not a physician.
2. There is no mention of any direction by physicians in the article; only administrators and their minions.
3. Statistics show one patient in five is desperately ill and one should be ambulatory. (The abuse of hospital facilities might be investigated.)
4. "We chose our nurses for their warmth and patience. Often at night a patient sits late over coffee with the nurse talking out his fears." (Who orders coffee for "his patients" late at night?)
5. His fifth unit, Extended Care, carries hospital administration into the home.

This Progressive Patient Care business has the hallmarks of a bid by the hospital administrators to control the practice of medicine. Already some administrators in St. Paul have blantantly attempted to gain control of the practice of Pathology and Radiology, both among hospitalized patients and on an outpatient basis. This is just a step in the establishment of control of general medical practice.

Perhaps the objectives of lay hospital administrators should be investigated. This investigative organization would, of course, follow Parkinson's first law and so ad infintum to be fundamental betterment of patient care.

Incidently, the Minnesota Blue Cross plan, the hospital administrators' own plan, thus far follows Parkinson's second law† to the letter.

Sincerely,
JOHN W. JAMES, M.D.

Saint Paul, Minnesota
February 19, 1960

*Parkinson's First Law: In any administrative organization, subordinates will multiply in accordance with a known formula and without relation to work (if any) expected of them.

†Parkinson's Second Law: Public expenditure rises to meet an income which is assumed to be limitless, a ceiling which is not there.



More gastric acid neutralized faster...with new Creamalin

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Tablets were powdered and suspended in distilled water in a constant temperature container (37°C) equipped with mechanical stirrer and pH electrodes. Hydrochloric acid was added as needed to maintain pH at 3.5. The volume of acid required was recorded at frequent intervals for one hour.



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NOT CONSTIPATING, New Creamalin Antacid Tablets will not produce "acid rebound" or alkalosis. They have a pleasant taste.

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EACH NEW CREAMALIN ANTACID TABLET contains 320 mg. of specially processed, highly reactive, short polymer dried aluminum hydroxide gel (stabilized with hexitol), with 75 mg. of magnesium hydroxide.

Adult dosage: Gastric hyperacidity—2 to 4 tablets as necessary. Peptic ulcer or gastritis—2 to 4 tablets every two to four hours. Tablets may be chewed, swallowed whole with water or milk, or allowed to dissolve in the mouth.

How Supplied: Bottles of 50, 100, 200 and 1000.

1. Hinkel, E. T., Jr.; Fisher, M. P., and Tainter, M. L.: *J. Am. Pharm. A. (Scient. Ed.)* 48:380, July, 1959. 2. Hinkel, E. T., Jr.; Fisher, M. P., and Tainter, M. L.: *J. Am. Pharm. A. (Scient. Ed.)* 48:384, July, 1959.

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The Physician's Diary

At the recent annual meeting of the medical staff of St. Mary's Hospital, Duluth, **Dr. Robert H. LaBree** was named chief-elect. **Dr. A. O. Swenson** was installed as **chief of staff, succeeding Dr. S. S. Houkom. Dr. William M. Spang** was elected secretary of the medical staff. Receiving honorary life memberships on the staff were **Dr. C. L. Haney, Dr. M. A. Nicholson, Dr. O. E. Sarff, Dr. D. F. Pennie,** and **Dr. D. W. Wheeler.** Elected to the executive committee as chiefs of clinical services for two-year terms were **Dr. W. A. Klein,** Orthopedics; **Dr. K. E. Johnson,** Obstetrics and Gynecology; **Dr. John B. Moyer,** Medicine; **Dr. J. H. Leak,** Eye, Ear, Nose and Throat; **Dr. M. M. Fifield,** Urology; and **Dr. R. J. Eckman,** General Practice.

* * *

Governor Orville Freeman has re-appointed **Dr. Harold A. Wente,** Rochester, to the Minnesota State Board of Health. **Dr. Frank H. Krusen,** Rochester, is president of the Board. His term expires January 1, 1961.

* * *

The Family Nursing Service of St. Paul recently honored **Dr. Robert Rosenthal** and **Dr. Lillian Nye** at their 24th annual meeting. The awards were presented for the doctors' participation in the Red Feather Agency for more than thirty years.

At a recent meeting of the nurses staff of St. Joseph's Hospital, Brainerd, **Dr. Joseph Marvin** gave a talk on Obstetrics and Gynecology.

* * *

The Renville County Hospital Board elected officers at the Board's recent annual meeting. **Dr. Leo Furr,** Bird Island, is chief of the medical staff.

* * *

Members of the Knight Youth Club of Cold Spring recently heard **Dr. John P. McNamara** speak on "A Psychiatrist's Secrets for Success." Doctor McNamara is medical director of the Central Minnesota Mental Health Center.

* * *

Dr. John A. Anderson, University Medical School professor and Head of the Department of Pediatrics, recently directed a course in pediatrics for general physicians held at the Center for Continuation Study at the University.

* * *

A practicing Minneapolis pediatrician for more than forty years, **Dr. Lawrence Richdorf,** was honored recently as A Venerable Old Pediatrician (VOP) by the "young upstarts" of the profession. Qualifications for the honor include being over sixty-five and having practiced in the



community for more than twenty-five years, according to **Dr. Lawrence F. Erickson,** Master of Ceremonies. Among those on hand to salute Doctor Richdorf were his first patient, **Dr. Harold Mork,** Anoka; Tom Cook, secretary of the Hennepin County Medical Society, and **Dr. John Anderson,** Head of Pediatrics at the University of Minnesota.

* * *

A paper entitled "Surgical Treatment of Diffuse Spasm of the Esophagus" was presented recently at a four-day sectional meeting of the American College of Surgeons in Boston by **Dr. F. Henry Ellis, Jr.,** of the Mayo Clinic. More than 4,000 surgeons and nurses attended the session.

* * *

Dr. Herbert L. Huffington, Jr., Waterville, has been appointed County Health Officer of Le Sueur County for 1960.

* * *

Members of the Southern Minnesota Academy of General Practice recently heard **Dr. Lyle A. French,** University of Minnesota brain surgeon, and **Dr. Malcolm McCannel,** University of Minnesota eye specialist, describe the latest in treatment of cataracts.

* * *

It has been announced that the Hibbing General Hospital medical staff has elected **Dr. J. W. Raattama,** Hibbing, president of the staff. Also elected at the annual meeting of that group were **Dr. K. E. Ahola,** vice president, and **Dr. J. J. Muller,** secretary.

A short ceremony was held recently in memory of **Dr. Winchell McK. Craig,** retired Head of the Section of Neurologic Surgery, Mayo Clinic, who died in February. **Dr. Charles A. Owen, Jr.,** presided at the ceremony. **Dr. Henry W. Woltman,** a longtime friend of Doctor Craig, read a tribute to Doctor Craig, and **Dr. Thomas B. Magath,** retired Rear Admiral in the Medical Corps of the U. S. Naval Reserve, read a tribute written by Rear Admiral B. W. Hogan of Washington, D. C., Surgeon General of the U. S. Navy. **Dr. Howard F. Polley,** Mayo Clinic, represented Ohio Wesleyan University. Doctor Craig had been a member of the Board of Trustees of Ohio Wesleyan for a number of years.

* * *

Dr. V. K. Funk, medical director of Glen Lake Sanatorium, has announced that the Sanatorium has received approval by the American Medical Association to establish a residency program in thoracic surgery. **Dr. James Seay** will fill the residency position. The approval has the consent of the American Board of Thoracic Surgery.

* * *

Members of the St. Olaf Hospital Auxiliary, Austin, heard **Dr. Paul C. Leck** give an address entitled "Rural Zoning and Sanitation," at a recent meeting.

* * *

A member of the Minnesota Department of Health, **Dr. Helen Knudsen,** recently spoke to a subcommittee of Community Chest senior citizens committee on licensing standards and the use of small nursing homes. The

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1. Pomeranze, J. et al.: J.A.M.A. 171:252, Sept. 19, 1959. 2. Walker, R. S.: Brit. M J. 2:405, 1959. 3. Odell, W. D., et al.: A.M.A. Arch. Int. Med. 102:520, 1958. 4. Pearlman, W.: Phenformin Symposium, Houston, Feb. 1959. 5. Lambert, T. H.: ibid. 6. Skillman, T. G., et al.: Diabetes 8:274, 1959. 7. Sugar, S. J. N., et al.: Med. Ann. Dist. Columbia 28:426, 1959.

subcommittee was organized to study problems arising from the new state law lowering payments given to unlicensed nursing homes.

* * *

At the 62nd annual meeting of the Psi Chapter of the Alpha Kappa Kappa medical fraternity, **Dr. A. C. Kerkhof**, Minneapolis, president of the Minnesota Heart Association, was given honorary membership. Honorary membership is awarded for distinguished medical and community leadership, and adherence to the "highest standards of medical practice." The award has been granted only nine times.

* * *

Dr. R. O. Sather, Crookston, was guest speaker of the Rotary Club at a recent noon luncheon. His subject was on "Heart Disease, Its Causes and Its Treatment."

* * *

A new Mayo Clinic heart study laboratory is nearing completion at St. Mary's Hospital, Rochester. The new laboratory, which will be used in the diagnosis and study of diseases and defects of the heart and circulatory system, will be staffed by four physicians, five technicians and a secretary. The physicians are **Drs. H. J. C. Swan, George D. Davis, O. W. Kincaid**, and **E. A. Moffitt.** The laboratory consists of two patient study rooms, a recording room, an x-ray control room, a blood-gas laboratory, a patient recovery room, a darkroom, a conference room, and offices for Doctor Swan and the laboratory supervisor.

As guest speaker at a Duluth Dental Society dinner, **Dr. William Martin**, Duluth cardiologist, recently spoke on coronary thrombosis cases. Doctor Martin explained how early detection of heart disease is possible through modern techniques and discoveries.

* * *

Members of the Albert Lea Lions club recently enjoyed a program provided by **Dr. H. B. Neel**, an Albert Lea surgeon. Doctor Neel described the foundation of the American College of Surgeons in 1913 and the role it plays in maintaining standards for the specialty, and went on to explain the history of surgery. He then showed a film, "The Hands We Trust," which was a narrative film on the training and studies required of a surgeon.

* * *

Dr. Mancel T. Mitchell has been elected chief of staff of St. Barnabas Hospital, Minneapolis, by the hospital's medical staff. **Dr. Charles A. Aling** was elected vice chief of staff and **Dr. Donald G. Bohn**, secretary.

* * *

Marshall physician, **Dr. Wayne Taintor**, has received a certificate of approval from the American Board of Abdominal Surgery to perform abdominal surgical work. The announcement came from Dr. Blaise F. Alfano, of the American Board of Abdominal Surgery.

* * *

Two members of the Mayo Clinic staff have been elected fellows of the American College of Radiology.

(Continued on Page A-76)

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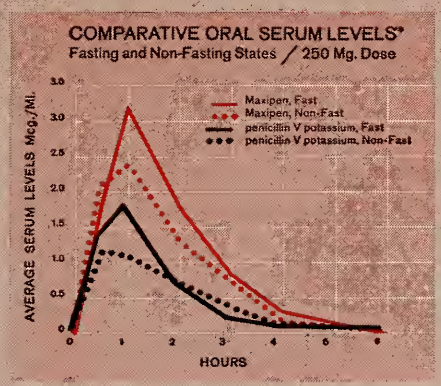
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(Continued from Page A-74)

They are **Dr. John R. Hodgson,** consultant in radiology, and **Dr. David G. Pugh,** consultant in the section of roentgenology. The doctors received degrees from the college at the Convocation recently during the Annual Meeting of the College in New Orleans. Elevation to fellowship in the college is based on outstanding contributions and service to radiology and follows election by all present college fellows.

* * *

Among the many talks given recently on heart disease, **Dr. John Meinert,** Willmar spoke on that subject to the Willmar Kiwanis Club at a noon luncheon. Doctor Meinert also distributed some pamphlets to the Kiwanians on the subject of heart disease.

* * *

Newly elected officers of the University of Minnesota Medical Alumni Association have been announced as follows: **Dr. Charles J. Beck,** North St. Paul, first vice president; **Dr. Neil M. Palm,** St. Paul, second vice president; **Dr. Robert H. Monohan,** St. Paul, treasurer; and **Dr. Sheldon M. Lagaard,** Minneapolis, president.

* * *

The Society of University Surgeons, an organization of teaching surgeons from the nation's leading medical schools, recently met in Minneapolis. The University of Minnesota medical school acted as host, with **Dr. Bernard Zimmermann** of the University's surgery staff in charge of arrangements.

Dr. J. B. Gaida, St. Cloud, spoke on causes, treatment and prevention of handicapped hearing during a public health nurses conference at St. Cloud. Approximately thirty-five public health nurses attended the one-day conference.

* * *

Members of the Hiawatha Valley Chapter of the National Paraplegia Foundation heard **Dr. Frank E. Krusen,** Mayo Clinic, speak on the progress of physical medicine and rehabilitation.

* * *

The Austin Clinic staff has announced the appointment of **Dr. John C. Patten** to the Clinic. Doctor Patten is a graduate of the University of Vermont Medical School, and recently completed a five-year surgical residency at Lenox Hospital in New York.

* * *

Dr. Owen Wangensteen, Chief of Surgery at the University of Minnesota Medical School, addressed the Society of University Surgeons when it met in Minneapolis. Doctor Wangensteen spoke on research and its vital importance to medical schools.

* * *

The Doctor's Committee of the LeCenter Community Club has announced that **Dr. Homer H. Russ,** formerly of St. Paul, will establish a general medical practice in LeCenter beginning July 1, 1960. Doctor Russ recently completed his internship at Bethesda Hospital, St. Paul, and received statewide publicity for an emergency heart massage that saved the life of a Roseville, Minnesota, infant.



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Among papers presented at the meeting of the Society of University Surgeons, **Dr. Claude R. Hitchcock,** Minneapolis, reported on work he and three colleagues are doing at General Hospital in isolating the abdominal cavity so cancer in that area can be exposed to highly potent drugs without damaging other parts of the body.

* * *

A recent issue of the *Sunday St. Paul Pioneer Press* featured a story on **Dr. F. H. Buck,** Shakopee. The article was written by Gareth Heibert and was an unusual feature going back to some of the doctor's early calls.

* * *

The monthly newspaper of the Rochester State Hospital, *The Elm Leaf,* was dedicated to **Dr. Magnus C. Petersen,** for the month of February. It is the first time the paper has been dedicated entirely to an individual.

* * *

The new Tri-County Mental Health Clinic at Grand Rapids has announced the appointment of **Dr. Frank Kiesler,** Minneapolis, as psychiatrist and director. Eight other psychiatrists had indicated interest in the post with the new clinic.

* * *

The St. Louis County Medical Society recently sponsored a symposium on alcoholism. **Dr. L. R. Gowan,** Duluth, was Chairman of the Planning Committee.

* * *

The *Litchfield Independent-Review* recently did a feature story when **Dr. Karl A. Danielson,** Litchfield, celebrated his 85th birthday. Doctor Danielson is still an active practicing physician.

* * *

A Community Mental Health Board has been formed by the counties of Crow Wing, Morrison, Todd and Wadena. Appointed to the Board are **Dr. John O'Leary,** Brainerd, representing Crow Wing county; and **Dr. Owen Bolstad,** Little Falls, representing Morrison county.

* * *

Dr. Clarence W. Moberg, Detroit Lakes, recently received the Becker County Farm Bureau's award of honor that goes annually to a businessman who has made a distinctive contribution to the interests of agriculture.

* * *

A Duluth pathologist, **Dr. Arthur Aufderheide,** was guest speaker at a meeting of the Range Medical Society. He spoke on "Factors on Tuberculosis Control in Northern Minnesota." Officers were also elected at the meeting. They are: **Dr. Ben Owens,** Hibbing, President; **Dr. R. T. Kelly,** Grand Rapids, Vice President; and **Dr. Fred Mast,** Chisholm, Secretary-Treasurer.

* * *

At the March meeting of the Minnesota Society of Neurology and Psychiatry, **Dr. Colin McDonald** spoke on "Sub-ependymal Gliomas, Their Clinical and Surgical Significance" and **Dr. William Fleeson** spoke on "Follow-up Studies of Regressive Shock Therapy."

* * *

Dr. Y. K. J. Gronquist, formerly associated with **Drs. R. H. Puumala** and **M. K. Bepko,** of Cloquet, has announced the opening of his office for the practice of General Surgery at 108 Carter Building, Cloquet.

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The second edition of "Functional Anatomy of the Limbs and Back" by **Dr. W. Henry Hollinshead**, Head of the Section of Anatomy of the Mayo Clinic, has been issued by the publishers, the W. B. Saunders Company, of Philadelphia. The new volume is a complete revision of 403 pages, and the text, which is considerably expanded, contains 159 illustrations. The first edition was published in 1951. Doctor Hollinshead is also the author of "Anatomy for Surgeons," a three-volume work published in separate volumes in 1954, 1956 and 1958 by Harper and Brothers, of New York City.

* * *

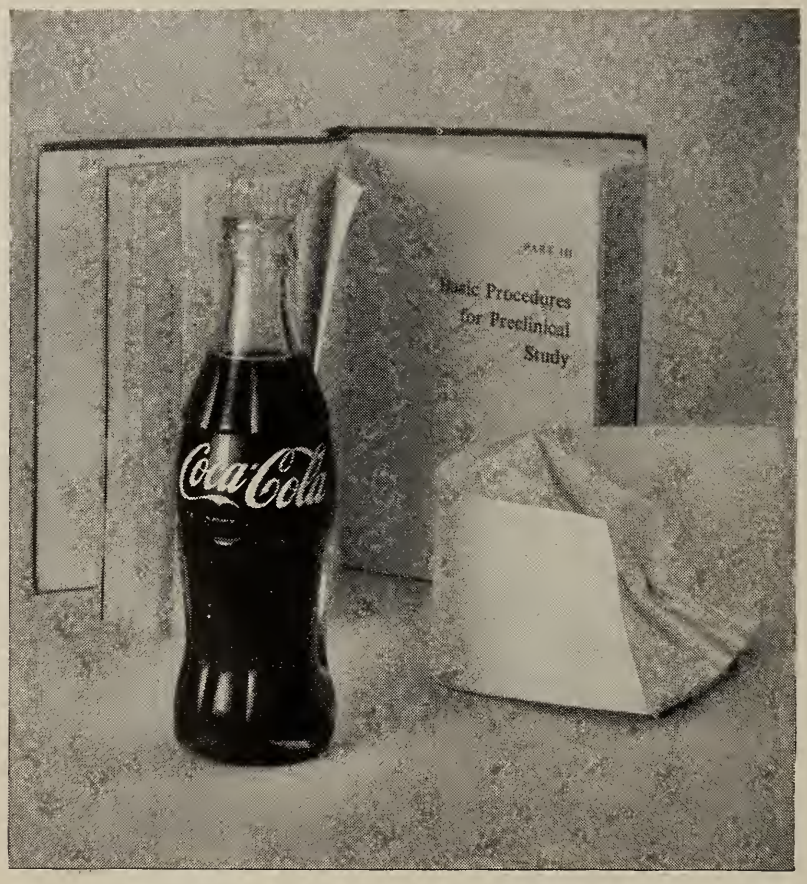
Dr. Jan H. Tillisch, Mayo Clinic, served as Chairman of the Board of Visitors of the Air University of the U. S. Air Force at Maxwell Air Force Base, Alabama, during the sixteenth annual examination of the professional education system of the Air Force which was held recently.

* * *

Knighthood in the Order of St. Gregory has been bestowed on **Dr. Charles Rea**, St. Paul, and five others by order of Pope John XXIII. This award is given to persons who distinguish themselves by their "virtue, piety, social position, zeal in fulfilling high office and by their excellent reputations."

* * *

Dr. J. A. Callan of the Lenont-Peterson Clinic, Virginia, attended the Annual Clinical Conference of the Chicago Medical Society, March 1-4, in Chicago.



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seem to crowd
the unyielding hours,
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Dr. Dorette Larson has accepted a position on the staff at the Moose Lake State Hospital. Doctor Larson previously practiced at Fergus Falls.

* * *

Presiding over the Third International Congress of Physical Medicine in Washington, D. C., will be **Dr. Frank H. Krusen** of the Mayo Clinic. Other Mayo Clinic staff members participating in the Congress will be **Drs. Edward H. Lambert,** and **Earl C. Elkins.** Delegates from twenty-seven countries are expected to attend the session. Vice-President Richard M. Nixon and his wife will be patron and patroness for the Congress. Previous sessions were held in England in 1952 and in Denmark in 1956.

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Book Reviews

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PRACTICAL PROCTOLOGY. 2nd edition. By Louis A. Buie, M.D., F.A.C.S., Emeritus head of the Section of Proctology of the Mayo Clinic, and Emeritus Professor of Proctology in the Mayo Foundation, Graduate School, University of Minnesota. 737 pages, 280 illus. Price $22.50. Springfield, Illinois: Charles C Thomas. 1960.

The first edition of Practical Proctology was published in 1937, and very shortly was out of print. It was a book of only 512 pages and 152 illustrations and it contained no color plates, whereas the new edition has twenty illustrations in color. For approximately twenty years, no copy of the first edition of *Practical Proctology* has been available at either bookstores or the publisher.

The new edition of Dr. Buie's book begins with the responsibility of the physician, proceeds through embryologic and anatomic considerations, preoperative and postoperative care and anesthesia, infection and the various conditions which may be encountered by the proctologist. Diagnosis and methods of treatment are based on some forty years of the author's experience in this specialty of medicine. "It was he who guided and nurtured this specialty in its early formative years and who is a guiding spirit in its present adulthood," Dr C. W. Mayo comments in the foreword.

In other respects, the book emphasizes the deep devotion to the art of practicing medicine which Dr. Buie has advocated throughout his career. This portion of the book has to do with reassuring the patient, quieting his fears, assisting him as much as possible to ensure a successful examination, relieving his pain and discomfort explaining to him what is to be done and why, and so arranging the program of treatment that the economic status of the patient will not be subjected to needless strain.

ANESTHESIA FOR INFANTS AND CHILDREN. Robert M. Smith, M.D., Anesthesiologist, Children's Medical Center, Boston, Massachusetts. 418 pages. Price, $12.00. St. Louis, Missouri: C. V. Mosby Company, 1959.

Dr. Robert M. Smith, as Anesthesiologist at the Children's Medical Center, Boston, has had a vast amount of experience with pediatric anesthesia. He has combined his clinical experience with well-chosen academic material to provide an excellent coverage of the subject.

The subject matter has been organized into thirty-one chapters. Each chapter is headed by a list of materia covered. The book is amply illustrated with diagrams lists, graphs, and black and white photographs.

The reader is led from the basic requirements fo pediatric anesthesia through the following groups c subject material: basic physiology of infants and chi

lren; preoperative preparation of the patient; descrip-ions and discussions of various procedures and tech-iques, first in general terms and then as applied to pecific types of surgery (neurosurgery, orthopedic sur-gery); and the postanesthetic care of the pediatric sur-gical patient.

The odds and ends of the subject have been well or-ganized into chapters at the end of the book entitled: Special Problems in Pediatric Anesthesia, Fluid and Blood Replacement, Anesthetic Complications, Oxygen Therapy, Mortality in Pediatric Surgery and Anesthesia, and The Legal Aspects of Pediatric Anesthesia.

This book is of interest primarily to anesthesiologists. All physicians, however, who are concerned with in-ants and children undergoing surgery will find the irst five chapters covering basic pediatric physiology and the preparation of the patient for anesthesia of nterest and value. Chapters 24 and 25 will be of qual or greater interest. These chapters cover Anes-hesia for Minor and Emergency Surgery and Special Problems in Pediatric Anesthesia.

In the reviewer's opinion, this is the best book to be published on the subject of pediatric anesthesia to date.

RUSSELL W. BAGLEY, M.D.

THE TREATMENT OF STAPHYLOCOCCAL DIS-EASES. Edited by Henry Welch and Maxwell Fin-land. Price, $4.50, cloth. New York: Medical Ency-clopedia, Inc., 1959.

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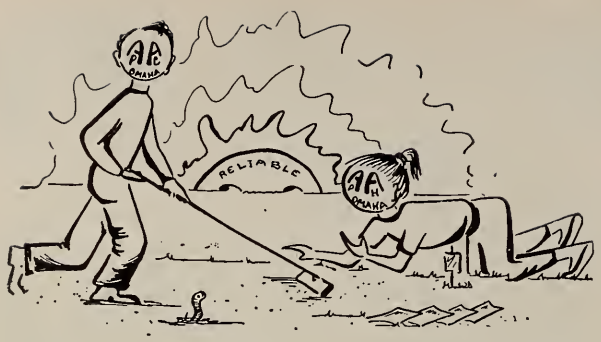


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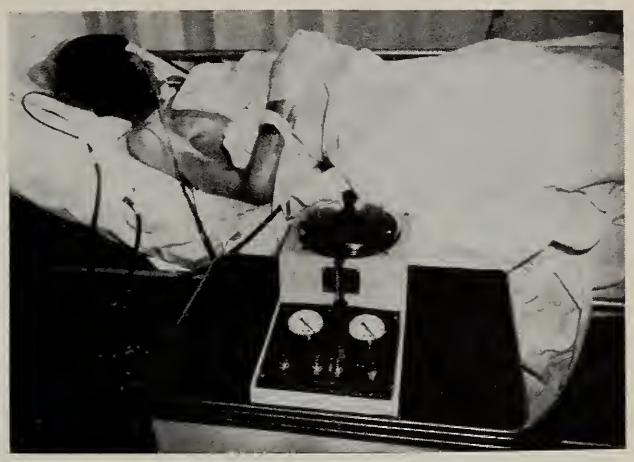


Fig. 1. Pump-refrigeration unit used for local gastric cooling.

Local Gastric Hypothermia in the Treatment of Massive Upper Gastrointestinal Hemorrhage

With a Discussion of Techniques

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EXPERIMENTAL work has demonstrated that local hypothermia of the stomach (15° C.) reduces gastric secretion markedly, completely inhibiting the digestive action of any gastric juice secreted.[1] The reduction of the digestive capacity of the gastric juice is dramatically demonstrated by the fact that small frogs with an attached oxygen line, placed within the stomach of larger frogs or dogs undergoing gastric cooling, are able to survive for prolonged periods of time, up to thirty-six hours.[2] The blood flow through the cooled dog's stomach (15° C.) measured by determining the venous outflow was found to be only one-third of normal.[3] Since constantly monitored blood pressure did not change, the assumption is that a concomitant reduction in arterial blood flow also occurs. It is the purpose of this paper to relate some of our experiences with local gastric

cooling in the control of massive gastric hemorrhage.

Apparatus

The special materials necessary for achieving effective local gastric hypothermia are a cooling unit similar to the one used in the standard home

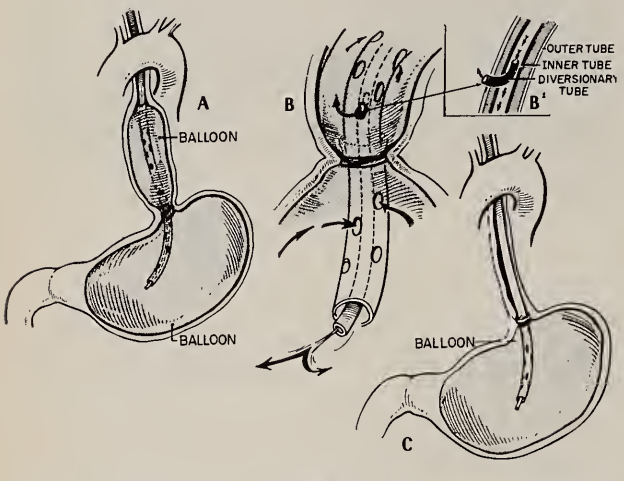


Fig. 2. Position of the balloon in the closed perfusion method. (A) Local hypothermia of the lower esophagus and stomach. (B. and B[1]) Details of the inflow and outflow of coolant to the esophageal balloon. (C) Local gastric hypothermia alone.

refrigerator, a reservoir, and a centrifugal water pump, which is capable of delivering at least 1 liter per minute.[1] A plastic catheter (1755 Bard & Company) with an outside diameter equivalent to a No. 18 French nasogastric tube will suffice as the outer outflow tube. A No. 260 polyethylene catheter is used as the inflow tube with a simple thin-walled dime-store latex balloon to receive the cooling fluid.

The refrigeration unit, reservoir, and water pump have been combined into a single mobile unit. Earlier units, with a gravity outflow system, relied on the level of fluid in the reservoir to activate the pump. The disadvantages of this system are the slower flow created by the use of gravity outflow and the alternating size of the intragastric balloon. A newer model, utilizing suitable valvular mechanisms, is a completely closed system and the fluid pumped into the balloon is replaced by a similar volume into the reservoir (Fig. 1).

Techniques

We have employed two techniques in obtaining local gastric hypothermia (Figs. 2 and 3). Our earlier and larger experience has been with a closed perfusion system employing an inlying gastric balloon attached to the double lumen tube. Under these conditions, a second nasogastric tube is necessary to maintain decompression of the stomach, to flush out blood or clots accumulating within the stomach and to provide evidence on whether the gastric bleeding continues or stops. The coolant fluid, a 30 per cent alcohol-water mixture, is pumped directly into the balloon which is inflated to a size adequate to fill the stomach without giving the patient discomfort. In this technique, the fluid must be perfused into the balloon at a temperature of —5° C., in order to obtain the ideal gastric wall temperature of 15° C. Experimentally, by using large tubing, not clinically feasible, to increase flow rate or by allowing the body temperature to drift to 30-32° C., a gastric wall temperature of 10-15° C. can be achieved with an aqueous perfusate at temperatures above the water freezing level.

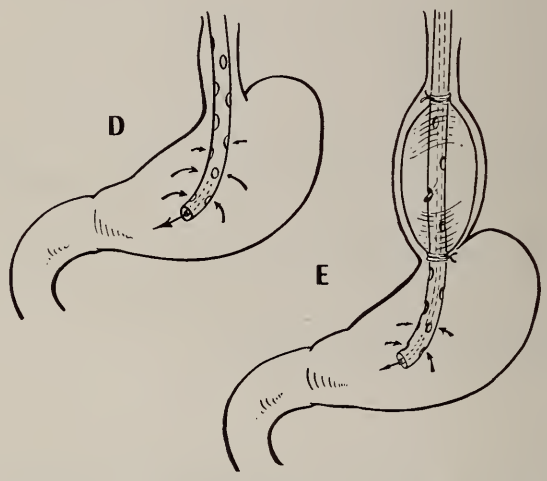


Fig. 3. Position of the tube in the open perfusion method. (D) Local gastric hypothermia. (E) Proposed method of achieving lower esophageal cooling by the closed technique combined with open gastric perfusion.

The advantage of the closed perfusion technique is that this system does operate smoothly once the tubes are in place; moreover, there can be no absorption of perfusate. The disadvantages lie in the difficulty encountered when placing the tubes and the circumstance that the patient must support the annoyance of two inlying tubes.

The alternate technique is the "open" perfusion method. Here, the double lumen tube is merely passed into the patient's stomach and the stomach

acts more or less as the balloon. In other words, fluid is perfused directly into the lumen of the stomach and accumulated blood and clots are washed out directly. This cooling scheme is more efficient and an inflow fluid at 5° C. will maintain the gastric mucosa at a temperature of 15° C. A number of coolants for this purpose have been employed; the best agent to date has proved to be a calcium-low milk (for example, S.M.A., Similac, Probana, et cetera). An earlier study in the dog indicated that local gastric cooling (15° C.) virtually closed the pylorus. In the cool stomach of man, the pyloric outflow is somewhat greater than in the dog. The advantages of this method are its ease of institution, and the possible nutritive effect the patient may receive from absorption of some of the milk during the perfusion.

A disadvantage of the method is that, although the pylorus is "closed off" in the cooling process, anywhere from 100 to 180 cc. of fluid is lost per hour into the small bowel. The method is not as adaptable, therefore, as the closed perfusion method in the care of patients with cardiac or renal difficulties, or in recent postoperative patients. There has been no trouble with tracheal aspiration when the stomach alone is being perfused openly. There is, obviously, some danger of tracheal aspiration from the esophagus in the open method, if both esophagus and stomach are being perfused.

When dealing with situations suggesting the need for perfusing both lower esophagus and stomach, we have come to employ a thin-walled latex balloon (condom) for the esophagus, while using the open technique in the stomach. In the closed method, simultaneous cooling of lower esophagus and stomach is achieved by the use of two balloons. Wangensteen (1959)[4] at the Presbyterian Hospital in New York reports use of a thin-walled latex flask-shaped balloon, which permits simultaneous cooling of esophagus and stomach with one balloon. We too, following his lead, have found this balloon (625 Airship Pioneer Rubber Co., Willard, Ohio) to suit the purpose admirably in simultaneous cooling of esophagus and stomach.

Experimentally, employing radiopaque material as the circulating medium in both the open and closed systems, it has been observed that all balloon techniques fail to fill the antrum completely (Figs. 4 and 5). On the other hand, the fundus and cardiac region of the stomach are uniformly well covered by the balloon. In the dog, even with filling of the balloon to cause marked abdominal distension, the antrum was not adequately cooled.

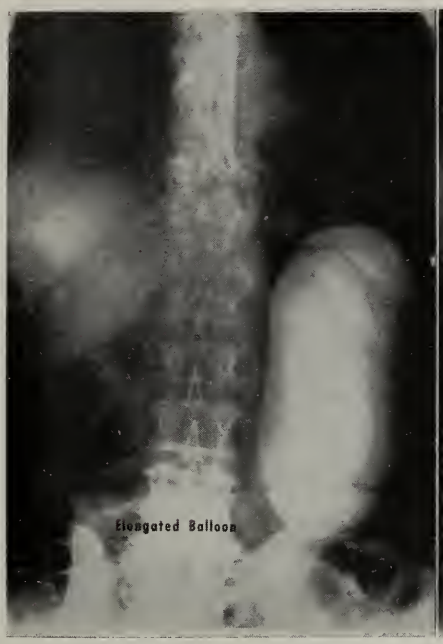


Fig. 4. The position of the 625 Airship balloon in a patient. Note the elongated neck of the balloon in place but without much flow through it, just at the esophagogastric junction.



Fig. 5. The double balloon technique for use in a patient with bleeding lower esophageal lesions. Note the extent of esophagus being cooled with this apparatus.



Fig. 6. Open perfusion of the stomach with closed cooling of esophagus, as observed in a dog.

The "open" perfusion method permits the cooling solution to reach every nook and cranny of the gastric mucosa (Fig. 6), and the important advantage of this occurrence has encouraged us to pursue the application of this technique in a larger number of our patients.

TABLE I. CONTROL OF MASSIVE GASTRIC HEMORRHAGE IN CLINICAL TRIALS

Lesion	Number of Patients	Number in Shock*	Number Controlled	Deaths Directly Due to Hemorrhage
Esophageal ulcer	1	0	1	0
Esophageal varices	5	3	4	1
Gastric ulcer	3	0	3	0
Erosive gastritis	4	1	4	0
Duodenal ulcer	13	8	13	0
Stress ulcer	4	3	3	2
Postoperative bleeding	10	5	6	1
Gastric CA	2	2	1	2
Hemorrhagic dyscrasias	2	0	1	2
Total	44	22	36	8

*Remaining twenty-two patients demonstrated Hgb. levels below 10.0 gms. together with need for rapid blood replacement to combat tachycardia, although they were not considered to be in shock clinically.

Several designs of balloons have been critically evaluated, and it would appear that the elongated balloon best meets the criteria of ease of passage and ability to cool the esophagogastric area sufficiently. It may be that the open perfusion of the stomach with closed perfusion of the esophagus will become the method of choice adaptable to all bleeding situations with the most comfort for the patient (Fig. 3e).

In further experiments, it has been noted that intragastric tension decreases during cooling, a reflection of the hypomotile state of the stomach.[5] At a gastric wall temperature of 10° C., the average intraluminal tension is reduced 6 cm. of water. Thus cold per se and not tamponade is the chief effect in stemming hemorrhage.

Indications and Contraindications

Our experience is still not sufficient to state that every patient with massive upper gastrointestinal bleeding is a suitable candidate for this type of treatment. Generally, the patients treated thus far have been those who have failed to respond to the usual methods of treatment and who continue to have massive hematemesis, despite the usual conservative measures of sedation, transfusion, nasogastric suction or a milk drip. The criteria we have employed as guides to invoke local gastric cooling for the control of massive gastric hemorrhage are two or all of the following: (1) shock, (2) continuing hemorrhage with a hemoglobin value of less than 10 grams, (3) necessity to continue transfusion in order to support a falling blood pressure and to control tachycardia.

Our experience has been sufficient to suggest that patients bleeding because of blood dyscrasia or a gastric cancer, are unlikely to respond to this form of treatment. If the blood dyscrasia is correctible by suitable measures, local gastric cooling will slow the gastric hemorrhage, thereby serving as an adjuvant measure in controlling the gastric bleeding temporarily.

Results

Our experience now totals forty-four patients. The current results follow pretty much the pattern of an earlier report.[6]

Gastroduodenal Ulcers and Erosive Gastritis

Approximately half the patients fall into the category of gastroduodenal ulcers and erosive gastritis, which group respond well to the use of local gastric hypothermia. Of this group, six were eventually operated upon; one 5 hours after cessation of hemorrhage, one almost a year after the control of hemorrhage by local gastric hypothermia.

A few representative case records will serve to give information concerning use of local gastric cooling in peptic ulcer.

Gastric Ulcer—Mrs. M. L., aged sixty-three, was admitted to this hospital in May, 1958, following two prior episodes of massive hematemesis with tarry stools and a long history of symptoms suggestive of duodenal ulcer, although this diagnosis had never been substantiated by barium studies. Bright red blood was readily obtained from the nasogastric tube, but she was not in shock. The patient's bleeding tests were all within normal limits, and the hemoglobin value was 9.7 gms., in spite of 1,250 ml. of blood given prior to the institution of local gastric hypothermia.

Bleeding stopped after six and one-half hours of cooling, during which time she received 1,250 additional ml. of blood, which restored the hemoglobin to 14.5 gms. No explanation for the hemorrhage was discovered despite a number of G.I. series until a year later, when a lesser curvature gastric ulcer was demonstrated by x-ray. A segmental gastrectomy was performed on May 11, 1959, for a histologically benign ulcer, and the patient recovered uneventfully.

Uremic Duodenal Ulcer.—Miss G. D., aged thirteen, with bilateral renal staghorn calculi, developed massive hematemesis with tarry stools. At the end of a four-day period of bleeding, and after having received 4,000 cc. of blood, the blood pressure dropped to 45 mm. Hg. Gastric hypothermia was carried out for 6 hours, during

which time the bleeding stopped. She received 850 ml. of blood and the vital signs stabilized.

Three days later, she again went into shock from recurrent massive gastric hemorrhage. Gastric hypothermia was reinstated and the bleeding again stopped quite promptly. With intensive antiulcer therapy, she has had no further bleeding episodes. A G.I. series performed later demonstrated "duodenitis." The patient has been able to tolerate several corrective urologic procedures since then without incident.

Duodenal Ulcer.—Mrs. B. M., aged fifty-seven, was admitted to the hospital on September 17, 1958, for recurrent ulcer. She gave a twenty-year history of epigastric pain relieved by eating. At the time of admission, she had tarry stools and shortly after admission began to bleed massively. Cooling was instituted when more conservative means failed to stop the bleeding. After seven and a half hours, she had stopped bleeding and a skim milk drip was reinstituted. She continued well until four days later, when again signs of bleeding appeared with tarry stools, small hematemesis of coffee ground material, and a few flecks of bright red blood and hemoglobin. The response to conservative management was satisfactory. The patient was operated upon on September 2, 1958 as an elective procedure (Billroth II). Recovery was uneventful and the patient has done well.

Esophageal Varices

Of the five patients with esophageal varices, four had definite control of their bleeding with use of local esophagogastric cooling. The fifth patient returned his hemoglobin to near normal levels before requiring operation to control persistent oozing of blood. All the patients had had attempts at control of hemorrhage by the use of the Sengstaken balloon without success. Our experience would suggest it is better to invoke local esophagogastric hypothermia immediately upon admission to the hospital. As was mentioned above, it is not pressure, but cooling that controls the hemorrhage. The ultimate fate of patients with intrahepatic block or portal hypertension from cirrhosis and bleeding varices is contingent upon the patient's ability to withstand definitive operative procedures. On this score, the patient with the extrahepatic block stands a better chance, because he usually has relatively normal liver function.

Esophageal Varices from Portal Hypertension.—Miss S. L., aged twenty-two, with a diagnosis of Banti's syndrome in the early 1940's, underwent splenectomy in 1943. In 1955, she underwent complete excision of the acid secreting area of the stomach with an esophagoantrostomy for bleeding esophageal varices. Upon recurrence of bleeding, a portal systemic shunt was attempted without success in 1956. Several subsequent bleeding episodes ensued requiring hospitalization and transfusion. In June of 1958, she was admitted in shock from massive hematemesis. There seemed to be no abnormalities in the clotting system. She received 4,500 ml. of blood during an unsuccessful trial at stopping hemorrhage with a Sengstaken tube. After seventeen hours of simultaneous local cooling of the stomach and lower esophagus, employing the closed technique, the hemoglobin value returned to a level of 15.1 gms. attending the transfusion of an additional 3,000 ml. of blood. She remained stable for approximately four and a half hours, when massive hematemesis recurred, followed by profound shock. Local gastro-esophageal cooling was again initiated which succeeded in stopping the bleeding. The hemoglobin rose to 14 gms. with 2,500 ml. of blood transfusion. As soon as her condition permitted, excision of the lower esophagus and antrum was performed with interposition of a jejunal loop. Since that time, there have been no further episodes of bleeding and the patient has done well.

Esophageal Varices as Result of Postnecrotic Cirrhosis.—Mrs. E. J., aged sixty-two, had hepatitis in the past with the development of posthepatitic cirrhosis and indicative liver function tests. She had had several episodes of hematemesis over the year and a half prior to this admission which was occasioned by exacerbation of bleeding. Her hemoglobin on admission was 8 gms. and her vital signs were stable. She was transfused carefully in preparation for a portacaval shunt scheduled for the morning of December 31, 1958. However, on December 30, 1958, after bleeding most of the day with replacement of 4000 ml. of blood, her hemoglobin showed no change and her vital signs deteriorated despite the presence of a tamponading Sengstaken tube. Because of this, local gastric hypothermia was instituted and carried out for twelve hours. Her vital signs stabilized and her hemoglobin rose to 14.9 gms. from 12.0 gms., with additional transfusion of 2,500 ml. of blood.

On the morning of her scheduled operation, the cooling balloon was removed and the patient underwent portacaval shunt successfully. Unfortunately, her postoperative course was complicated by severe jaundice and deranged liver function. A small enteric fistula developed during early convalescence which failed to close spontaneously despite the absence of any signs of obstruction. The jaundice slowly cleared, but the general course was downhill, and the patient succumbed three months postoperatively. Bleeding did not recur. Had the liver function been better, the recovery of the patient would have been assured.

Postoperative Bleeding from a Variety of Lesions

Postoperative bleeding, often manifested by hemorrhagic gastritis, represents a special problem. The bleeding in such patients may well be owing to stress gastritis or ulcer, imposed by trauma of an operative procedure or catastrophy. The treatment of these patients heretofore has been extremely futile, but some success attends use of local gastric hypothermia. Six of ten postoperative

patients with this complication have been controlled successfully. The urgency of the situation is apparent in that three of the four patients not controlled by cooling required operative intervention and eventually succumbed to sepsis which, together with the antecedent operation, constituted the stress that precipitated the hemorrhage.

Postoperative Bleeding.—Mr. R. B., aged fifty-six, on October 1, 1959, underwent a Billroth II gastrectomy because of a bleeding duodenal ulcer, in an outlying hospital. Subsequent obstruction of the efferent limb of the gastrojejunostomy necessitated an exploration three weeks later. A bypassing enteroenterostomy was performed and the patient soon began to bleed massively from the upper gastrointestinal tract. During the following four weeks, the patient was sustained by intravenous fluids and required 100 transfusions for recurrent episodes of bleeding. When admitted to this hospital, the blood pressure was stable, the pulse rapid, 120 or higher, the hemoglobin 9.7 gms. Frequent transfusions, the return of bright red blood from the nasagastric tube, and the poor condition of the patient dictated the use of local gastric hypothermia for the control of bleeding. Closed perfusion slowed the bleeding to a slow ooze, while the hemoglobin returned to normal. Shift to open perfusion confirmed the suspicion that the stomach was totally obstructed. Therefore, when the patient's condition stabilized, a transthoracic truncal vagotomy with intubation of the narrow efferent limb stoma through a gastrostomy opening, and a feeding enterostomy were performed on November 27, 1959. Although an anastomotic ulcer seemed likely, it was impossible through the diaphragmatic incision to ascertain exactly the nature of the obstruction or to rectify it.

The patient then did well for eight days, when massive hemorrhage attended removal of the gastrostomy tube, which had been placed through the efferent stomal outlet. Shock and a drop of hemoglobin to 10.3 gms. occurred. Closed local gastric hypothermia was successful in stopping the bleeding promptly; even so, cooling was continued for forty-eight hours. A skim milk drip demonstrated persistent outlet obstruction. Nutrition was mainained by daily enterostomy feedings of 3,000 cc. whole milk supplemented with intravenous glucose and electrolytes. On December 18, 1959, seventy-nine days following the initial gastric surgery and twenty-three days after admission here, a procedure directed at correction of the persistent outflow obstruction was undertaken. Localized abscess formation and dense adhesions made mobilization of the stomach pouch impossible. Therefore, a compromise procedure with excision of the nonfunctioning enteroenterostomy on the efferent limb, and a new enteroanastomosis between the afferent and efferent limbs was effected. Closure of the resultant 15 cm. longitudinal defect in the efferent limb was accomplished by a single layer of interrupted 5-0 sutures of silk. Continuity of the small bowel was established by an end-to-end jejunal anastomosis. A total of 153 tranfusions, that is, more than 75 liters of blood, were given to this patient during this time.

The patient survived the ordeal nicely. He was dismissed to his home on January 19, 1960. After more than two months of parenteral therapy, he was resuming use of the upper segment of the digestive tract for ailmentation. The enterostomy tube was removed on a return visit to the Out-Patient Clinic, at which time the patient was taking 2700 calories or more daily by mouth.

Postoperative Bleeding.—Mr. H. J., aged sixty-nine, had an episode of obstructive jaundice three years prior to this admission. He was treated by cholecystectomy and common bile duct exploration with removal of two stones. In one and one-half years later, his jaundice recurred and re-exploration of the subhepatic area was attempted, but abandoned because of bleeding. His jaundice relented only to recur shortly before his first admission here on August 12, 1959. All tests prior to his surgery indicated an obstructive jaundice, with normal coagulation mechanism. Re-exploration on August 14, 1959, was attended by a sizable loss of blood due to the marked vascularity of the adhesions in the subhepatic area. A gall bladder with thickened walls, but containing green bile was discovered, and there was a great deal of induration and scarring about the head of the pancreas. It was impossible to ascertain the nature of the pancreatic lesion, so a bypass cholecystojejunostomy was performed.

Postoperatively, the patient did well for four days, when he developed sudden, massive upper gastrointestinal hemorrhage and went into shock. He received 2,500 ml. of blood rapidly, but the hemorrhage continued. Local gastric hypothermia induced a rapid halt in the bleeding. The patient's vital signs stabilized and his hemoglobin rose to 14.3 gms., with transfusion of 1500 ml. of blood. He had several more episodes of hematemesis over the next four days, which were controlled adequately with frequent manual flushing of the stomach with iced saline solution. He was discharged on his twenty-second postoperative day, and has remained without bleeding to the present day.

"Stress" or Steroid Ulcers

The group of steroid or stress ulcers demands special consideration. It would appear that the so-called stress ulcer, whether gastric or duodenal, represents a special entity, somewhat apart from the usual peptic ulcer. Once hemorrhage is controlled by local gastric cooling, definitive therapy is in order. Granted the general condition permits, when bleeding has been controlled by local gastric hypothermia, such patients should undergo operation. In one patient with metastatic breast cancer, a bleeding gastric ulcer as a result of cortisone therapy, failed to respond completely to local gastric cooling. Two patients experienced rebleeding a few days following control of their initial hemorrhage. These experiences have taught the necessity of advising operation in patients who have been under steroid therapy. Rebleeding is

much more likely to occur than after cooling for a chronic duodenal or gastric ulcer.

Stress Ulcer.—Mr. D. V., aged sixteen, suffered a fracture of C-5 in a diving accident on August 1, 1958, resulting in complete quadriplegia, was being treated with Crutchfield tong traction. The admission hemoglobin was 18 gms.; sixteen days later, the patient had an emesis of coffee ground material. This was soon followed by bright red hematemesis and a decline in the hemoglobin to 7.0 gms., where it remained despite transfusion of 1,500 ml. of blood. The vital signs remained stable and all bleeding tests were normal. Because of continued hematemesis, local gastric hypothermia was instituted. The bleeding stopped and the patient's hemoglobin returned to normal with an additional 2,000 cc. of whole blood.

The patient then did quite well for four days, when massive hematemesis recurred. Cooling was reinstated and his bleeding again stopped. During this time, he received 4,250 ml. of blood and the hemoglobin reached 16.3 gms. The patient has had no further episodes of bleeding. A subsequent G.I. series showed marked spasm of the duodenal bulb. His gastric juice has demonstrated the strong digestive action characteristic of duodenal ulcer.

Can Local Gastric Cooling Accelerate Ulcer Healing?

Inasmuch as virtual suppression of gastric secretion and inhibition of peptic activity of the gastric juice can be achieved by local gastric cooling, the question naturally arises: Could the healing of ulcer craters be accelerated by the use of this method? The place, obviously, for trial of the method would be in duodenal ulcer, employing the open method of perfusion with calcium-poor milk at a temperature low enough to suppress gastric secretion, but not so low that gastric emptying would be completely arrested by an immobile pyloric sphincter. Certainly, the method deserves trial. Failure to heal peptic ulcer by conservative means is owing primarily to the circumstance that, feeding stimulates acid-peptic secretion with the result that the pH of the resultant gastric mixture at times falls well into the range of a very active peptic digestion. Lowering of the gastric temperature to suppress gastric secretion and inhibit peptic activity without obstructing outflow of the coolant employed might make an important addition to our medical armamentarium to encourage healing of ulcer defects. Moreover, the ulcer defect has to heal to complete epithelialization or the stage is set immediately again for recurrence of the ulcer and the development of a crater. Neither starvation nor feeding can inhibit gastric secretion and peptic activity. Local gastric cooling can. Very little has been added to the conservative management of peptic ulcer since Cruveilhier of Paris inaugurated frequent feedings of milk to patients with "round ulcer," more than a century ago.

Summary and Conclusions

Local gastric hypothermia has been shown experimentally to reverse many of the factors responsible for hemorrhage in the peptic ulcer diathesis. Therefore, it is not surprising to find use of local gastric hypothermia very efficacious in the management of massive gastric hemorrhage from a variety of manifestations of the peptic ulcer diathesis. It has been very reassuring, too, to note its effectiveness in the control of massive hemorrhage from esophageal varices. It has proved quite successful also in cases of erosive gastritis, which is in reality a peptic ulcer variant.

Massive gastric hemorrhage occurring postoperatively in patients is essentially a stress ulcer phenomenon. Some instances of massive hemorrhage following operation are found to be owing to hemorrhagic gastritis. Even though controlled by local gastric cooling, the tendency of recurrence is so high that operation is to be recommended, if the patient's condition permits. Moreover, hemorrhagic gastritis often demands extensive gastric resection to insure effective control of the hemorrhage. Use of local gastric hypothermia in patients suffering from gastric tumors or blood dyscrasias rarely offers complete cessation of hemorrhage.

References

1. Wangensteen, O. H., Root, H. D., Jenson, C. B., Imamoglu, K., and Salmon, P. A.: Depression of gastric secretion and digestion by gastric hypothermia; its clinical use in massive hematemesis. Surgery, 44:265, 1958.
2. Griffen, W. O., Jr., Salmon, P. A., Paterson, J. R. S., and Wangensteen, O. H.: The effect of hypothermia on gastric digestion. Federat. Proc., 18:60, 1959.
3. Salmon, P. A., Griffen, W. O., Jr., Paterson, J. R. S., Fattah, F., and Wangensteen, O. H.: Effect of intragastric temperature changes upon gastric blood flow. Proc. Soc. Exper. Biol & Med., 101:442, 1959.
4. Wangensteen, S. L.: Personal communication, December 1959.
5. Salmon, P. A., Jenson, C. B., Griffen, W. O., Jr., and Wangensteen, O. H.: Effect of temperature on intestinal motility. Surgery, 46:5:873, 1959.
6. Wangensteen, O. H., Salmon, P. A., Griffen, W. O., Jr., Paterson, J. R. S., and Fattah, F.: Studies of local gastric cooling as related to peptic ulcer. Annals Surg., 150:346, 1959.

Contamination of Milk with Penicillin

Cranberries and capons are not the only foods that may contain contaminants. It has been recognized for several years that milk may be contaminated by enough penicillin to cause reactions in persons who are unusually sensitive to the antibiotic.
The author discusses this problem and presents data regarding 609 farms in this region.

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SENSITIVITY to penicillin is increasing in frequency and severity in the general population at an alarming rate.[1] The ever-increasing incidence of various allergic reactions caused by penicillin has made it the primary problem of drug allergy.[2] Frequent reactions and many sudden deaths from anaphylaxis following the administration of penicillin has occurred in the United States and other countries.[3] Most of these patients did not require the antibiotic as a lifesaving measure,[4] and many of them denied having received penicillin previously.[5] A W.H.O. bulletin in 1958, analyzing the data on 2,500,000 patients, each receiving from one to twenty-five injections of penicillin, revealed a reaction rate of approximately 2 per cent and fatal reactions in one of each 70,000 patients treated.[6] The use of skin tests before the administration of penicillin might aid in reducing the incidence of these reactions by revealing reactivity in highly susceptible persons.[2,5]

Welch and associates,[7] from a nationwide survey, estimated that 95 per cent of severe anaphylactic reactions and 85 per cent of other types of moderately severe reactions to antibiotics were caused by penicillin. These reactions included serum sickness, diarrhea, angioneurotic edema, urticaria and other dermatologic lesions. Welch[8] estimated that between 17,000,000 and 20,000,000 Americans may experience undue reactions to antibiotics at some time during their lives.

According to Vickers and associates,[9] many "allergic" reactions and dermatologic lesions of obscure origin may be maintained indefinitely by the ingestion of cow's milk containing penicillin as a result of the treatment of bovine mastitis. In a carefully controlled study, Zimmerman[1] showed that chronic or recurrent urticaria may be caused by the ingestion of such contaminated dairy products. The role of penicillin in these reactions was indicated by the use of penicillinase, which resolved urticaria occurring after the ingestion of dairy products or prevented such a reaction if given first.

In the Section of Dermatology at the Mayo Clinic, we have seen a twenty-three-year-old woman who had a persistent oral and cutaneous bullous eruption that simulated pemphigus vulgaris clinically and histopathologically. This eruption disappeared without specific treatment when milk and other dairy products were eliminated from the diet. Vickers and associates described acute dermatitis and a vesicular reaction in sensitive patients living on dairy farms where the milk contained up to 4 units of penicillin per milliliter. Thus, by drinking 1 liter of milk daily,

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Fig. 1. Inhibition of growth of Sarcina lutea on Penassay agar by specimens of milk contained in steel cups. Note the absence of inhibition by the specimens to which penicillinase was added.

a patient unwittingly could ingest as much as 4000 units of penicillin each day.

Welch[8] reported three independent surveys on the amount of penicillin found in grocery-store samples of processed milk procured in many different locations in the United States, refrigerated and flown to Washington, D. C. These surveys disclosed the presence of penicillin in 3.2 to 11.6 per cent of the samples, the amount varying from 0.003 to 0.550 unit per milliliter. Penicillin was not found in powdered milk, evaporated milk, ice cream or butter. In a further nationwide survey in the fall of 1958 and the winter of 1958 to 1959, a total of 1170 samples of milk from the tanks of producers or from collecting trucks were tested. The presence of penicillin, confirmed by the use of penicillinase, was shown in 3.7 per cent of these samples, the concentration ranging from 0.006 to 1.22 units per milliliter. The decrease in the incidence of milk contaminated by penicillin in the various surveys was attributed to education of the farmer. It also may have been influenced by seasonal variations in bovine mastitis and by the source of the specimens.

Milk from an individual farm usually is placed into a bulk tank. Tanker trucks collect refrigerated milk from the bulk tanks of several farms, transporting this mixed milk to the dairy, where the milk is further mixed with that from other tankers in a large collecting vat before it is processed. Thus, milk containing penicillin and originating from the collecting tank of a single farm may contaminate a much larger volume of milk in the vat, although at a proportionately lower concentration. The mixed milk is distributed after rapid processing, including the "flash" method of pasteurization (165° F. for sixteen seconds), which does not destroy penicillin.

Thus, milk from one treated cow that may contain a relatively great concentration of penicillin may account for a large number of distributed whole-milk products containing penicillin at a concentration proportional to the dilution factor of the original specimen.

Method of Testing

Specimens were placed in steel cups on cultures of Sarcina lutea growing on Penassay agar. This organism is widespread in distribution, easily obtained, nonpathogenic to humans and extremely susceptible to antibiotics. It grows readily and rapidly under a wide range of external conditions. Zones of growth and inhibition can be easily

discerned and measured quantitatively on Penassay agar, which is eminently suitable for the estimation of penicillin.

Zones of inhibition of the growth of the organism showed the presence of an antibiotic (Fig. 1). Penicillin was identified by the use of penicillinase in control cups. Accurate quantitative estimation of the concentration of penicillin present was made by comparing the size of the zone on inhibition with that of controls and with a curve previously prepared with various known concentrations of penicillin.

TABLE I. CONTAMINATION OF BULK MILK WITH PENICILLIN AND OTHER ANTIBIOTICS (JUNE-JULY, 1959)

	Number of Farms	Penicillin Present	Other Antibiotics Present	Per Cent Showing Penicillin	Amount of Penicillin, Units/ml.
Dairy A	214	4	1	2	0.011-0.013
Dairy B	395	8	—	2	0.02-0.07
Total	609	12	1	2	—

Results of Present Study

Preliminary Survey.—To ascertain the scope of this problem in Rochester, Minnesota, and the surrounding regions, an initial survey was made of the dairy products used by a single restaurant. These were pasteurized commercial products supplied by a large local dairy, whose field of distribution is both local and national.

Twelve of nineteen samples (63 per cent) of pasteurized whole milk, skim milk, buttermilk, cream and dressed cottage cheese tested on different days contained penicillin, identified by the use of penicillinase. Three of five specimens tested on another day contained an antibiotic other than penicillin.

Multiple checks on dry powdered milk, evaporated milk, dry cottage cheese, butter and ice cream showed that these products were consistently free of demonstrable penicillin or other antibiotics.

This initial survey, conducted in the spring of 1959, also showed penicillin to be present in the raw milk from two of five farms supplying the dairy; one sample contained 0.07 unit per milliliter.

Detailed Survey.—A detailed survey then was made of specimens of milk from the bulk tanks of 609 dairy farms, spread over a radius of 150 miles, that provided the source of milk for two large dairies. Two per cent of these specimens contained penicillin varying in amount from 0.011 to 0.07 unit per milliliter (Table I).

The discrepancy between this figure of 2 per cent, which was obtained in midsummer, and the previous incidence in the spring survey of penicillin occurring in two of the five farms and in 63 per cent of distributed milk products may be related to dilution and blending factors, as well as to seasonal variation in the incidence of mastitis in dairy herds. Bovine mastitis is commonest in the spring, when cattle are crowded together indoors while the weather is still cold and wet. This seasonal variation in mastitis and the related increased use of penicillin in spring may account for a seasonal incidence of reaction in consumers of dairy products. Thus, recurrent urticaria or other cutaneous reactions with exacerbations in the spring may be related to widespread use of penicillin for bovine mastitis at such times.

The manner in which penicillin in the milk from one farm can appear in a lower concentration in a larger volume was clearly illustrated when the milk from one farm, supplying 3432 pounds of milk in each bulk tank, collected every other day, showed the presence of penicillin in a concentration of 0.07 unit per milliliter. The milk in the tank of the collecting truck, containing 11,129 pounds of milk from this and several other farms, contained 0.018 unit per milliliter. Milk from the other farms did not contain any penicillin. The concentrations of penicillin measured in the bulk tank at the original farm and in the collecting tanker correspond to the dilution factor within 20 per cent. This shows that the laboratory estimations were accurate at least to this degree.

Comment

Sources of Penicillin.—In tracing the origin of this penicillin, it should be realized that approximately 25 per cent of the 26,000,000 cows in the United States have mastitis,[10,11] the incidence having increased with the widespread use of milking machines. Most of these machines will continue to "dry milk" the udder after the milk ceases to flow. This trauma predisposes to infection by Streptococcus agalactiae, a penicillin-sensitive organism that is involved in more than

70 per cent of cases of bovine mastitis. This condition usually is treated by dairy farmers themselves, using easily procured antibiotic preparations. The most commonly used method is to insert penicillin directly into the affected quarter of the udder via the teat, using the nozzle of a prepared, manually compressible plastic container. The dose of penicillin in these preparations is limited to 100,000 units by order of the Federal Food and Drug Administration. A directive on each container states that the milk from the treated quarter should not be used for human consumption for seventy-two hours after treatment is given.

However, it is extremely difficult to enforce these directions and they are not closely followed. Doses of penicillin in excess of 100,000 units often are given locally. Other antibiotics, especially neomycin, bacitracin and streptomycin, are added to these preparations. Extremely large doses of penicillin also are given intramuscularly in the treatment of bovine mastitis. Penicillin given in this way may be concentrated in the milk.[12]

The concentration of penicillin in milk may be so high, even after pasteurization, that "starter" cultures of the Lactobacillus used for the manufacture of cottage cheese may be inhibited.[13] This is of significant economic concern to the manufacturing dairies, who not only lose their product and time but also have considerable expense in disposing of the waste.

Suggestions for Control of the Problem.—The following suggestions may be advanced to minimize the contamination of dairy products with penicillin:

1. Improvement of herd management on dairy farms to lessen bovine mastitis, with avoidance of cold, wet and overcrowded conditions, especially when cattle are kept indoors.
2. Use of improved milking machines that automatically stop milking each quarter of the udder as the milk ceases to flow, avoiding trauma from "dry milking," which predisposes to the development of mastitis.
3. Use of antibiotics only under the supervision of veterinarians.
4. Education of dairy farmers to eliminate milk from treated cows from their bulk tanks.
5. Administration of penicillin to cows only when clear-cut indications for its use are present.
6. Close control by dairies, which can test milk for penicillin using the method already outlined. Such control now has been instituted by the large dairies in Rochester, Minnesota. They have outlined their program and its significance to their suppliers, and they reject all milk from any farm whose collected milk contains penicillin.
7. Use of dry powdered milk, which does not contain penicillin.

Summary

Severe reactions to penicillin given therapeutically now constitute a major health hazard. Reactions of sensitization may be expected to occur from the ingestion of milk and other dairy products containing penicillin used in the treatment of bovine mastitis. Urticaria that is recurrent or seasonal may be related to the variations of mastitis in cows, with peaks of incidence in the spring and fall. A local survey demonstrated penicillin in more than half of distributed pasteurized dairy products. Another survey showed penicillin in 2 per cent of the milk tanks on 609 farms. Methods of control are outlined.

References

1. Zimmerman, M. C.: Chronic penicillin urticaria from dairy products, proved by penicillinase cures. A.M.A. Arch. Dermat., 79:1, 1959.
2. Feinberg, S. M., and Feinberg, A. R.: Allergy to penicillin. J.A.M.A., 160:778, 1956.
3. Farber, J. E., Ross, Joseph, and Stephens, George: Antibiotic anaphylaxis. California Med., 81:9, 1954.
4. Rosenthal, Abraham: Follow-up study of fatal penicillin reactions. J.A.M.A., 167:1118, 1958.
5. Smith, V. M.: Fatal reactions to penicillin: An evaluation of a test for sensitivity. New England J. Med., 257:447, 1957.
6. Guthe, T., Idsöe, O., and Willcox, R. R.: Untoward penicillin reactions. Bull. World Health Organ., 19:427, 1958.
7. Welch, Henry, Lewis, C. M., Weinstein, H. I., and Boeckman, B. B.: Severe Reactions to Antibiotics: A Nationwide Survey. In Welch, Henry, and Marti-Ibañez, Felix: Antibiotics Annual. New York: Medical Encyclopedia, Inc., pp. 296-309, 1957-1958.
8. Welch, Henry: Problem of antibiotics in foods. J.A.M.A., 170:2093, 1959.
9. Vickers, H. R., Bagratuni, L., and Alexander, Suzanne: Dermatitis caused by penicillin in milk. Lancet, 1:351, 1958.
10. Trump, F.: Aureomycin for mastitis. Michigan Farmer, 104:16, 1950.
11. Committee on Animal Health, National Research Council: The intramammary therapy of bovine mastitis. J. Am. Vet. M. A., 108-127, 1946.
12. Schipper, I. A., and Olson, C. C.: Antibiotics in raw milk—a case history in prevention. J. Am. Vet. M. A., 134:404, 1959.
13. Krienke, W. A.: Penicillin in milk: A hazard to starters, buttermilk and cottage cheese manufacture. Milk Dealer, 39:126, 1949.

Beliefs and Misbeliefs in Proctology

The author believes proctologists would do well to review their ideas and their practices regarding the common diseases of the anus and rectum. Unnecessary hemorrhoid surgery is frowned upon, and the author points up the need for a conservative approach to this problem. After reading this article, it is obvious the anal and rectal area is the seat of considerable controversy regarding management of specific lesions.

EXPERIENCE has been called the end-result of the incorrect performance of an act a sufficient number of times until eventually the performer becomes an expert at doing it the wrong way. The same may be said of ideas. One may acquire a false concept of a certain situation, and even though it is incorrect, this idea may be nurtured until it becomes a fixed belief. The thoughts expressed in this paper are to an extent sufficiently unorthodox so as to risk being placed in the latter category; however, I believe that with a modicum of logic they are tenable.

In medical discussions, not infrequently we hear that this or that particular operation is being performed too often, for example, too many gastrectomies, hysterectomies, tonsillectomies, et cetera. The same accusation has been directed toward hemorrhoidectomies. With this I disagree. The trouble is not that they are being done too often, but that often they are being done to the wrong people.

There is hardly a known pathological condition easier to diagnose than hemorrhoids. All one needs is an anoscope and reasonably good vision. The distinction, however, between hemorrhoids *per se* and those which are giving symptoms is not so easy since the latter diagnosis requires a certain amount of cerebration which is always tiresome. Should I be accused of exaggeration, let me add that I have had patients who have had hemorrhoidectomies for the relief of symptoms caused by ulcerative colitis, proctitis, backache, carcinoma of the rectum, carcinophobia, proctalgia fugax, the levator syndrome, carcinoma of the cecum, and anal pruritus. Needless to say, the operation was not a signal success in any of these patients.

In a manner of speaking, hemorrhoids are a sort of normal abnormality because there are millions of people in this country who have them and who are quite comfortable and symptomless. But to add to the confusion, a new type of patient has appeared on the scene. This patient is the result of the widespread propaganda to aid in the prevention and cure of cancer. He may be the one whose

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Uncle Joe recently died of cancer in California, and now he begins to worry as to whether or not he has cancer. As with many people, his self-consciousness prevents him from simply telling the truth; in his case, that he has no rectal trouble, but is worried, and he trumps up a number of fake symptoms which he describes with earnest plausibility. Once assured that he does not have a cancer this person is usually satisfied, and may even admit that his symptoms did not amount to much. However, since most laymen know that untreated piles turn into cancer, at least a few are willing candidates for surgery. This, of course, makes two strikes in favor of the doctor.

Internal hemorrhoidal tissue occurs to a greater or lesser extent in everyone over the age of thirty or thirty-five. Most probably, if any proctologist were questioned as to the truth of this statement, unless he thought it was a leading question, he would agree. Who, then, should be operated upon or treated? First, any patient who regularly bleeds from piles (and only after an accurate determination that this is so); and secondly, any patient whose piles prolapse on bowel movement, or on lifting or straining. The patient, who has as his chief complaint backache, leg-pains, vague rectal or pelvic pain, pressure, constipation, or anal pruritus should be viewed with a jaundiced eye insofar as treatment of his hemorrhoids is concerned. If a surgeon has not operated upon a patient suffering from the ills just mentioned, he may be accused of being a stupid doctor, but at least he is not about to be asked questions he cannot answer when the patient stays the same or gets worse following his operation. It is my belief that the mere presence of piles is not sufficient indication for operation, and even when hemorrhoids do give symptoms, they are almost always purely local in character.

Every year several new operations are described for the surgical treatment of piles with insistence that meticulous attention be paid to the peculiarities of the author's pet technique. I doubt that there are twenty or thirty different ways of removing hemorrhoids, all correct. Nonetheless, the one thing all authors agree upon, is that every vestige of hemorrhoidal tissue must be removed. And this despite the above-mentioned fact that there are literally millions of persons with moderate to large internal hemorrhoids who are going about their daily business contentedly and symptomless. Insofar as complete removal is concerned, I have examined patients who had had hemorrhoidectomies done by competent proctologists who adhere to the sacred tenet of complete removal of hemorrhoidal tissue, and yet these patients have had a recurrence to the extent of daily bleeding. This is not an indictment of the operation; it is merely an indictment of the operator who is certain that complete removal always prevents recurrence. I believe that in the main most persons will be completely and permanently relieved of their symptoms by the removal of the three main hemorrhoidal groups. If it takes a person thirty years to develop piles, it seems likely that with 90 per cent of the tissue removed, it will take him at least an equal time to develop hemorrhoids which will again give him symptoms. The fact that patients occasionally have recurrences after either the injection or after surgical treatment is no reason for condemning either method. I know of no treatment that can be guar-

anteed 100 per cent except amputation. Once a leg is off, it is completely and permanently off, and there is no argument about it. If patients are selected with reasonable judgment, I believe, the result by either method will be satisfactory. There are many patients who cannot be treated successfully by injections, but when they can, the treatment is quantitative, and is not a question of all or nothing as is true of a hemorrhoidectomy.

Let us take, for example, a sixty-year-old man with moderately large internal piles. His bowel habits are satisfactory and he has no anal or rectal discomfort. Last week he began to have daily bleeding with his bowel-movements. He is no worse off, nor is he different from what he was the week before except that he was not bleeding then, and now he is. Let us assume that it has been definitely established that his bleeding is from his piles. Two weeks ago he did not know there was anything amiss, but now, if he consults a surgeon, who treats piles only surgically, he is told that an operation is necessary. It is all, or nothing. I believe that this patient can have a sufficient number of injections to control his bleeding and that neither he nor I need be concerned about his piles. If it is truly of paramount importance that all hemorrhoidal tissue be removed, I suggest that all physicians submit to operation since they, together with 90 per cent of all adults, have some piles.

Now a few words about anal fissure. The patient with this condition has so typical a story that one can often make a diagnosis without examination. Nonetheless, after examination and diagnosis, the next decision is what to do about it. The recently formed fissure with no attendant sentinel pile, with no hypertrophied anal papilla, and with little or no anal fibrosis will almost certainly get well without surgery. On the other hand, the deep, chronic fissure with a sentinel tag, anal fibrosis, and anal papilla will never heal without operation. When one is uncertain about the various gradations between these two extremes, there is no harm in trying conservative treatment for two or three weeks before advising surgery. By conservative treatment I do not mean silver nitrate, ointments, or suppositories, none of which have the slightest influence on the healing of a fissure. Silver nitrate merely adds insult to injury, while even anesthetic ointments have a minimal effect on deep-seated pain. Suppositories for the relief of anal discomfort might better be inserted in the ear, which is more conveniently accessible, and where they will do as much good. My remarks concerning suppositories will probably have no deterrent effect on those who prescribe them for all patients on whom a diagnosis has not been made.

A peri-anal abscess gives a history equal to that of an anal fissure, that is, constantly increasing pain unrelated to bowel movement, which usually drives the sufferer to seek medical aid at the end of three or four days. If an abscess is suspected, and it should be from the symptoms, it still may be one of the few instances in which the tenderness and swelling are not sufficiently marked to make one certain. The importance of immediate diagnosis lies in the fact that if an abscess is present it should be drained the same day, while if none is present, the delay in diagnosis is not important. In cases of uncertainty, the leukocyte count is the deciding factor. With an abscess, the count will be between 12,000 to 20,000. If the count is normal, no abscess is present. I believe that a peri-anal or peri-rectal abscess which is scheduled for morning surgery has been mistreated since, having been seen the day before, it should have been opened at that time. Opinions to the contrary may be found in the textbooks, but I believe there is no excuse for waiting for such an abscess to "point."

The fanfare during the last few years over the subject of rectal and colonic polyps has done a vast amount of good. But it has served to breed considerable confusion in the minds of many, as well as frightened an impressive number of laymen. In the first place, the term polyp is an unfortunate one since it has a purely morphologic connotation and gives no hint as to the histologic type of tumor. Unfortunately, however, the term is here to stay.

It is assumed that the so-called polyp is a pre-malignant lesion, and it probably is. One must say probably because we have no way of proving that all polyps become malignant, nor, if they do, how long it takes. When we speak of pre-malignant polyps, what we are actually talking about are adenomas. We are fairly certain of the malignant potentialities of adenomata. On the other hand, a lymphoid follicle in the submucosa, or a papillary excresence with a normal mucosal covering, while possibly polypoid in shape, is not pre-malignant.

In 1955, Wilson, Dole, and Brines reported the results of 20,847 proctoscopic examinations. The incidence of adenomatous polyps was 3.95 per cent, while at the University of Minnesota Cancer Detection Center the incidence of so-called polyps was 16 per cent. This explains why examination

of patients from the Center by Twin Cities proctologists fail to reveal polyps in at least 50 per cent of the cases.

Because of their adjacence to the anus, pilonidal cysts and sinuses are assumed to lie within the province of the proctologist. There are few surgeons who are not acquainted with the troublesome so-called recurrences following operations for these conditions. I say so-called recurrences because I doubt that the failure to heal properly is frequently a recurrence at all. Without considering the cause of this condition, the theories of which are certainly under revision at present, let us consider the surgical treatment. In all surgery, the failure to restore the patient to good health comes under one of several headings. In the case of new-growths, for instance, it may be an incomplete removal of the tumor; in a surgical repair such as that of a hernia, it may be a failure to remedy the defect; sometimes it is a failure to eradicate a source of infection, and finally in the face of a completely successful operation, the unsatisfactory result may be due solely to the surgery itself.

In the case of pilonidal cysts, the complete eradication of the cyst is usually not difficult, and I imagine that in most cases it is accomplished. The recurrences are probably not as often recurrences of the original lesion as simply the inability of the healing tissue to cope with an area which has a peculiar topography. Many times the very extensiveness of the operation in itself is a cause of failure.

Many operations have been devised for this troublesome condition, and some of them quite ingenious, even as my own, which although theoretically perfect, in reality is not much better than the others. The cyst or sinus is located in a more or less deep groove between the nates. The more extensive the operation and the more tissue removed, the deeper the groove and its defect. During or even after healing, the sitting position tends forcibly to widen the defect, for the lines of force act laterally and secondarily and tend to pull the tissues outward from their healed or healing bed at the bottom. I have seen a healed pilonidal wound with firm skin develop a collection of blood or serum and finally break through, and leave the patient with the same situation he had at the beginning: a draining sinus. I think it quite probable that the less extensive the operation, the more likelihood there is of satisfactory and permanent healing. This is substantiated by a rather impressive series in which the author reports almost no recurrences. He merely laid open all tracts and removed almost no tissue.

As to my views on pruritus ani, I should like to quote from the address of the chairman of the Section on Dermatology of the A.M.A., J. Walter Wilson:

"To the dermatologist there appears to be only one logical line of demarcation that needs to be considered, the mucocutaneous junction at the anus. It cannot be denied that from this point outward all that which is encountered upon the surface of the body is skin, subject to all the diseases to which the skin in general is susceptible, in addition to a few that are peculiar to this area. Thus, it seems to the dermatologist that a physician must of necessity know the greater portion of the science of dermatology, if he is to claim the experience expected of a specialist in assuming the care of an ailment external to the mucocutaneous junction. Yet, some proctologists consider a circular area perhaps up to a dozen inches in diameter centered about the anus to lie well within their field. Dermatologists highly respect the ability possessed by proctologists to deal with such conditions as carcinoma of the colon, fistula-in-ano, hemorrhoids, and prolapse which require much specialized training and experience. It can be said with confidence that none certified in dermatology attempts to treat such proctologic conditions. Realizing the importance of acquiring and maintaining skill in such valuable techniques, proctologists naturally devote all of their study time to them and are never found in attendance at skin clinics. Thus, they have no opportunity to learn to respect the difficulties of dermatology. As an example of the resulting lack of diagnostic ability, proctologic literature contains many discussions devoted to pruritus ani. It is obvious to the dermatologist that pruritus ani is not a disease and that it does not even deserve to be classed as a diagnosis, since it is only the translation into Latin of the symptom complained of by the patient. It is also obvious to the dermatologist that there can never be a single truly successful treatment for pruritus ani since there are altogether too many different causes that must be differentiated and specifically controlled. Proctologists treat many cases on the assumption that they are due to fungus infections, yet never bother to ascertain whether fungi are present. Dermatologists treat itching of the anal area only if there is a dermatosis present that matches the symptom; otherwise consultation with a proctologist is advised. This is also their procedure when such itching does not subside quickly and simultaneously with the clearing up of the dermatosis since they realize that a deep-rooted disease may easily have been the original cause of such a complaint. Dermatologists are firmly convinced that it would be better for such patients if proctologists would reciprocate by displaying a similar respect for dermatology."

And so do I.

Injuries to the Eye and Visual Apparatus Associated with Injury to the Head, Neck, and Chest

Here is a comprehensive and useful review of the many possible injuries to the eye and its associated structures.

MAN'S DEVELOPMENT of terrific speeds of travel on and above the earth's surface, his increasing use of ever more powerful industrial equipment, and his ingenious development of ways of race destruction by means of instruments of war have resulted in heightening the incidence of head, neck, and chest injuries to an extent unknown to previous generations. But the increasing skill developed in dealing with these injuries has achieved a survival rate which is permitting us to better realize their immediate and remote after-effects. Many of the findings and after-effects of head injury have profound ophthalmological significance. Besides the secondary involvement of the visual apparatus in head and general bodily injury, we frequently see direct injury to the eye and its adnexa. The eye is well protected anatomically by the brow, orbital rim, and lids, and by its situation in an elastic fat pad. It is also protected physiologically by lid reflexes and by reflex head turning. In spite of this protection, the incidence of injury to the eye is relatively high.

Direct Injury to the Eye and Adnexa

The effects of injuries to the eye are much more severe than similar trauma to other parts of the body because of the delicacy of ocular tissue, and because trauma, which would cause only temporary inconvenience elsewhere, can cause blindness here. Ocular injury is a social and economic hazard which results in great loss of human happiness, in economic inefficiency, and in monetary loss.

Injuries to the eye in automobile accidents fall into two general catagories: lacerations and contusions.

Lacerations

Lacerations of the Lids.—Lacerations of the lids are of importance because of the possibility of serious sequelae which may cause visual loss. Serious complications of lid lacerations may be disalignment of the cilia with trichiasis, entropion, ectropion, coloboma with exposure of the globe, ptosis, epiphora, and cosmetic defects.

Lacerations which run parallel to the lid margins have edges which fall together easily and heal nicely; while lacerations vertical to the lid margins usually gape widely, due to the pull of the orbicularis fibers. Careful suturing of the muscle prevents unnecessary scarring and deformity.

Careful and adequate treatment of lid lacerations is of extreme importance because in this way one may prevent most of the serious complications of lid lacerations and minimize those lid deformities which can not be prevented. Repair of lid lacerations should be performed as soon as the patient's general condition will permit. Bleeding is controlled and the wound is cleansed of all foreign matter. Some times foreign bodies can be palpated with the finger tip more easily than they can be

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seen. The wound should be irrigated with warm saline and a minimal bridgement carried out. The extent of the wound should be determined and the lid structures identified. At the time the lid wound is examined, the globe should also be carefully examined for evidence of injury. If the tendon of the levator muscle has been cut, it should be carefully repaired with fine chromic catgut sutures. A good repair of the levator tendon or muscle will prevent or minimize a future ptosis problem. In lacerations of the upper lid, one should have the patient raise his lid to check the levator function before anesthesia is administered. If the medial or lateral canthal ligament is cut, it should be repaired.

In lacerations through the entire lid, the margins must be brought together with meticulous accuracy to prevent notching and deformity. The posterior margins, as well as the lash line, must be brought together accurately. The lid is sutured layer by layer with fine catgut in the tarsus and orbicularis muscle. The skin is sutured with fine silk.

If the wound is more extensive and involves considerable loss of tissue, protection of the eye becomes a primary consideration. A good step in the plastic repair can be made by bringing skin from another area to fill the defect and by lining this with reflected conjunctiva or grafted buccal mucosa. Further plastic repair can be performed later.

Laceration of a lacrimal canaliculus is an unfortunate type of injury because the discomfort of epiphora may result. The lower canaliculus must be functioning to prevent epiphora for the superior canaliculus alone is usually not enough to carry away all of the tears. Loss of the superior canaliculus alone does not produce epiphora. The lacerated canaliculus should be sutured over a probe or cannula which is left in place from two to three weeks.

Laceration of the Globe.—Laceration of the globe, no matter of what degree, represents a severe eye injury. Vision may be lost due to secondary infection or to direct injury to the structures of the eye. In all head injuries where there is local injury about the eye or where the patient's spectacle lenses have been broken on the face, one must examine the eye for a perforating injury.

Lacerations of the cornea may be accompanied by a prolapse of the iris and injury to the lens. The laceration may extend past the limbus into the sclera. An attempt should be made to save all injured eyes unless the damage to the eye is so extensive that no hope of vision is present and the danger of sympathetic ophthalmia does not warrant attempting to save a blind eye.

When the cornea is lacerated, the wound is repaired by cleansing the wound margins of foreign

material and excising any prolapsed iris. Lens pulp in the wound is removed. The iris within the eye is reposited to free the wound edges within the eye. The corneal wound is sutured edge to edge with fine silk sutures (6-0 or 7-0) and fine hand honed cutting needles. Enough sutures are placed in the wound to make a tight closure, and air is injected to reform the anterior chamber. Antibiotics are given in large doses and penicillin and streptomycin are usually injected subconjunctivally. The eye is inspected daily and the corneal sutures may be removed in from twelve to fifteen days.

Lacerations which extend into the sclera present a graver problem because of the frequent loss of vitreous.

Scleral lacerations may also be studied unless the injury is extremely large. In that case, it is frequently wise to eviscerate the sclera and place a gold, glass, or plastic implant within the sclera, thus providing the patient with an excellent stump for a prosthesis.

Concussion and Contusion of the Globe

Injuries to the globe due to blunt force are varied and are frequently of a serious nature. The wounding capacity of the impact is related to the kinetic energy involved. The kinetic energy of a moving body increases arithmetically with regard to its weight and geometrically in relation to its velocity. If two bodies are traveling at the same rate, but one body has twice the mass of the other, the kinetic energy of the one is twice that of the other. If they have the same mass, but one travels with twice the speed of the other, the one will have four times the kinetic energy of the other.

Injury to the Lens in Contusion of the Globe.—The lens is frequently traumatized in these blunt injuries. Apart from paresis and tearing of the iris, lenticular changes are the most common sequelae of injuries of this type.

There may be various degrees of dislocation of the lens. If the lens is luxated into the anterior chamber, the eye usually develops a secondary glaucoma and surgical treatment to remove the lens is indicated. Dislocation of the lens into the vitreous occurs twice as frequently as dislocation into the anterior chamber. The lens in the vitreous is better tolerated than in the anterior chamber but may result in iridocyclitis and a general deterioration of the eye. Injury to the suspension mechanism of the lens varies in degree, and usually the dislocated lens remains in the hyaloid fossa. The lens is tremulous as is the iris. In the case of a young person, the lens becomes more spherical, and the eye becomes myopic. If the lens is freed from its zonules only on one side, the lens may assume an irregular shape so that the eye develops myopic astigmatism. The lens may gradually sink lower in the eye due to gravity, and vitreous may herniate past the lens into the anterior chamber.

Lenticular opacities following a blunt blow on the eye are not uncommon and present a variety of biomicroscopic pictures with the slit lamp. In general, there are three types of lens opacity following this type of injury. The first type is a ring corresponding to the pupillary aperture composed of myriads of reddish-brown granules of pigment deposited flatly on the anterior lens capsule. The ring is typically 1 mm. in diameter and probably represents iris pigment pressed into the lens capsule in the manner of a rubber stamp. This is called a Vossius ring after the ophthalmologist who first described it. The second type of lens opacity is that of localized opacity due to subcapsular change. This may be disseminated subepithelial opacity, it may be film-like cobweb opacity, or it may be lamellar in appearance. Sometimes these lens changes, especially if mild, will clear during the first few days or weeks after the injury, but in other cases, they will go on to an atrophic condition of the lens or precipitate the development of pre-senile or senile changes. The third type of lens opacity from blunt trauma is diffuse cataractous lens change which is usually associated with a capsular tear. This usually progresses to a total lens opacity. Children will frequently show considerable absorbtion of the cataractous lens material if the rent in the capsule is fairly marked. The great majority of lens opacities from contusion requires no treatment because the opacities are not marked and remain stationary. When the opacity is dense, surgical removal of the lens may be indicated.

Injury to the Choroid and Retina in Contusion of the Globe.—The choroid and retina suffer various degrees of damage from contusion and vision is frequently damaged due to injury to these structures.

Hemorrhage into and detachment of the choroid are common injuries due to contusion and are followed by secondary atrophic changes in the

retina. Another type of choroidal lesion, which is commonly seen in severe contusions, is choroidal tear, either single or multiple. Serious retinal lesions consist of concussion edema of the retina (commotio retinae), concussion necrosis of the retina, traumatic macular cysts and holes, peripheral retinal atrophy, and retinal detachment. A careful ophthalmological examination should be made of these eyes to search for damage to the retina and choroid.

Hemorrhage in Contusion of the Globe.—Intraocular hemorrhage is commonly seen after a contusion to the eye. The hemorrhage may be limited to the anterior chamber, hyphemia, and may vary in degree. Primary hyphemia appears at the time of the accident with a blood level in the anterior chamber. Such hemorrhages usually absorb readily, but the picture may be complicated by a secondary hemorrhage which usually occurs on the third or fourth day following the injury. The secondary hemorrhage tends to be severe and is a serious complication. The eye may be severely damaged in marked hyphemia due to secondary glaucoma and by blood staining of the cornea. Such staining of the cornea results when the anterior chamber is filled with blood and there is an elevated intraocular pressure.

The treatment of hyphemia is bed rest, sedation, and binocular bandaging. In the initial stages, cold compresses give comfort and may help to control the bleeding, while subsequently hot compresses may be of benefit. Atropine should probably not be used. If the intraocular pressure rises, miotics may be used as well as carbonic anhydrase inhibiting drugs such as acetazolamide. Paracentesis of the anterior chamber may be indicated if it remains full of blood and if there is an intractable secondary glaucoma. In some cases, lavage of the anterior chamber may be indicated.

Hemorrhage into the vitreous tends to absorb slowly, and if the hemorrhage is massive, vision is seriously threatened because of a persistent vitreous turbidity.

Ophthalmological Findings in Head Injuries

Ophthalmological findings in head injuries are extremly common. In 610 cases of fracture of the skull, Blakeslee[1] found that 475 (about 78 per cent) manifested eye signs. Most of these ophthalmological findings clear up, but late ophthalmological sequelae are relatively common. In analyzing 500 cases of head injury Hooper[2] found ocular sequelae in fifty-eight.

Hemorrhage into Lids, Conjunctiva, and Orbit

The finding of ecchymosis of the lids (black eye), orbital hemorrhage, and conjunctival hemorrhage brings up the question of the origin of the bleeding. The main point in differential diagnosis is whether this bleeding is due to local lid trauma, orbital bleeding from an orbital fracture, or whether blood enters the orbit from a basal skull fracture. Local contusion of the lids produces an almost instantaneous swelling of the lids due to edema and hemorrhage. This is frequently so marked that it may be extremely difficult or even impossible to separate the lids enough to examine the eye. The area of ecchymosis and edema extends beyond the orbital rim onto the cheek and forehead, and is not sharply circumscribed. The lids are typically reddish-purple following the injury with bright red blood seen beneath or in the conjunctiva. The color of the lids then changes in a few days through purple, greenish brown, and eventually to a yellowish appearance. In the vast majority of injuries to the local tissues about the eye, there is no serious eye injury but contusion to the globe may occur.

Hemorrhage into the orbit and lids from a fracture of the orbit or skull appears twelve to twenty-four or more hours after the injury. Usually there is enough bleeding in orbital fractures so that a fairly marked exophthalmos occurs. Sometimes the orbital bleeding will have localizing value as to the location of the orbital fracture. From a fracture of the roof of the orbit, the blood usually follows along the levator muscle and appears in the upper lid. From an apex fracture, the blood follows the lateral rectus muscle and appears under the conjunctiva temporally. From a fracture of the orbital plate of the sphenoid, the blood tends to follow the lateral wall of the orbit. In a fracture of the floor of the orbit, the blood appears in the lower lid.

Hemorrhage into the orbit from a basal skull fracture presents a similar picture to that of orbital fracture but may be somewhat more delayed in appearing. In basal skull fracture, the blood seeps along the floor of the orbit and appears typically toward the nasal side in the subconjunctival tissues of the lower lid. In Blakeslee's[1] series of 610 cases of skull fracture, he found subconjuncti-

val and lid hemorrhage in about 17 per cent of the cases. An extravasation of blood appearing in the orbit at an interval greater than twenty-four hours after a head injury with or without loss of consciousness is pathognomonic of fracture of the base of the skull.

Subconjunctival hemorrhage due to local injury usually has the dense part of the hemorrhage on the anterior portion of the globe and the hemorrhage thins out or disappears toward the equator of the globe. If the bleeding is retrobulbar in origin, the subconjunctival hemorrhage is most dense posteriorly and fades out toward the limbus. The hemorrhage may be conjunctival in cases of local injury while the hemorrhage due to posterior bleeding is subconjunctival, which can be demonstrated by moving the conjunctiva over the hemorrhage.

Hemorrhage into the lids from posterior bleeding tends to be limited by the orbital margins and the result is a circumscribed circular area of ecchymosis, whereas hemorrhage from local trauma usually extends over a wider area. This circular limitation in posterior bleeding is due to the attachment of the palpebral fascia to the orbital margins.

Pupillary Phenomena in Head Injury

Pupillary changes are common in severe head injury and occur in about two-thirds of all cases of basal skull fracture. Pupillary changes frequently disappear after a few days. Usually the pupillary changes are present immediately after the head injury. In some cases, pupillary signs may be late in developing. Mydriatics should not be used and, if possible, morphine should be withheld because of the danger of masking these pupillary signs.

Widely dilated pupils, fixed to light (Hutchinson's pupil), are seen in deeply comatose patients. This is a grave prognostic sign, for most of these patients die. In Blakeslee's[1] series, 95 per cent of these cases failed to survive. If the pupils are widely dilated but react to light, the prognosis is much better and only about 30 per cent of these patients die.

Unilateral dilation of the pupil with loss of both direct and consensual light reflex is an important sign in head injury. Uusually, a dilated fixed pupil immediately after the injury indicates an injury to the third nerve or the third nerve nucleus. In this case, there will be other evidence of third nerve injury such as ptosis and extraocular muscle palsy. If the dilated fixed pupil becomes manifest sometime after the injury, the finding is almost diagnostic of a subdural or extradural hemorrhage and there is usually a skull fracture present. The pupillary dilation may follow an interval of miosis. This finding is an indication for a decompression operation because it is due to a gross cerebral shift causing the hippocampus to herniate into the tentorial hiatus so as to impinge upon and stretch the third nerve. In a very high percentage of cases, the hemorrhage is on the same side as the dilated pupil and the pupillary sign is an indication as to which side the decompression should be done on. If the clinical finding changes gradually from a unilateral dilated fixed pupil to bilateral dilated fixed pupils, there is an increased intracranial pressure. Along with the pupillary changes, the patient will be found to have developed papilledema. Because of the importance of these pupillary signs and because these are sometimes transitory they should not be masked by the use of mydiatics or morphine.

Slight inequality of the pupils with sluggish pupillary reaction is a common finding in midbrain damage and is a more frequent sign of persistent damage to this region than ophthalmoplegia. The large pupil is usually the abnormal one.

Injuries to the Visual Pathways

The optic nerve may be injured directly by penetration of the orbit by objects or indirectly by concussion and fracture. Injury to the optic nerve is relatively common in concussion injuries, particularly those caused by a frontal blow and only occasionally when the injury is caused by a temporal blow. Optic nerve injury occurs rarely when the violence comes from the posterior direction.

Traumatic amblyopia and optic atrophy following a blow on the forehead is a condition which has been recognized from the time of the early writings in medicine and has received much attention through the years. Hippocrates interpreted this as a reflex amblyopia. Typically, the patient receives an injury from the impingement of a blunt force in the region of the forehead or brow. Upon regaining consciousness, the patient notices a complete loss of vision, usually in one eye, although

bilateral visual loss does occur. Not all of these injuries are associated with loss of consciousness, and there are cases on record where a relatively mild blow has caused complete optic atrophy. In a case of my own, an eighty-three-year-old woman in an auto accident hit her forehead on the back of the front seat of the car. She was never unconscious and her only severe injury was to the right orbit. She had no light perception in the right eye and no direct pupillary reaction. The pupil reacted consensually. She had exophthalmos with bleeding into the orbit. She developed optic atrophy and had no return of light perception. Skull x-rays were negative. Special x-ray studies of the right orbit showed a fracture in the region of the apex.

Many of these cases develop a complete loss of vision with optic atrophy, but other cases show varying degrees of recovery of vision. In some cases, the patient recovers completely. When vision returns, improvement usually starts about the third or fourth day and continues through a four- or five-week period. All degrees of visual impairment may occur and various sector and scatomata field defects may remain. In about 40 per cent of these cases, no light perception returns. Ophthalmoscopically, these eyes are normal immediately after the injury. Optic atrophy can usually be detected in from fourteen to twenty-one days, but it has been noted to appear earlier than this as well as later. There is probably a direct relationship between the distance behind the globe that the optic nerve is injured and the time it takes for optic atrophy to appear.

The mechanism by which the optic nerve is damaged varies in different cases. The optic nerve damage is probably due, in the majority of cases, to either fracture of the optic canal, subvaginal hemorrhage with pressure on or tearing of the nutrient vessels of the optic nerve, intraneural hemorrhage, or concussion of the optic nerve.

There are also chiasmal and post chiasmal injuries to the visual pathways. In many of these good recovery of vision occurs, but in some there is a permanent visual field defect. Most cases, in which there is severe injury to the optic tracts, have such severe brain damage that the patient does not survive. With traumatic lesions of the optic radiations, there are varying degrees of hemianopic field defect. There is a direct relationship between how far back along the optic radiations the injury is located and the similarity or congruity of the visual field defect in the two eyes. Frequently, there is considerable clearing of the field defect as the acute disturbance of the trauma subsides. Trauma to the frontal and occipital region, particularly by a blunt force, may produce occipital lobe injury. The visual field defect is usually transient but occasionally small homonymous scatomata appear which are permanent. These injuries are frequently on the basis of a contrecoup mechanism.

Ocular Motor Phenomena

Ocular motor injuries complicate about 1 per cent of all head injuries.[3] The clinical picture varies from total ophthalmoplegia to syndromes involving individual nerves. The nerves affected are the sixth, third, and fourth in order of frequency. When the third nerve is injured, there is an accompanying ptosis. Complete third nerve involvement occurs infrequently, and one must suspect a fracture through the superior orbital fissure. In this case, there is also anesthesia of the cornea due to damage to the first division of the fifth nerve. Often with these severe orbital injuries, also optic nerve damage occurs. The site of the injury may be nuclear or a nerve root lesion due to brain stem trauma. There may be trunk lesions due to basal fracture, or mechanical displacement of the nerves caused by a meningeal hemorrhage.

When paralysis immediately follows the injury, there has usually been a direct injury to the nerve; while in cases where the paralysis is delayed, the paralysis is a result of pressure usually due to bleeding. The prognosis for return of function is much better in the delayed paralysis. Prognosis for recovery from all types of extraocular paresis is surprisingly good, although three to nine months may elapse before diplopia disappears. With residual paresis, diplopia may be overcome by prisms; but if the diplopia is so marked that prisms will not help, surgery on the extraocular muscles is indicated. During the recovery period, there is a great tendency for the patient to occlude or not use the eye with the paretic muscle. He should be prevented from doing this because he may promote the development of contracture of the direct antagonist to the paretic muscle thus making the return of function even more difficult. The patient should use one eye one day and the other eye the next day in a program of alternate occlusion and thus minimize the tendency for secondary con-

tracture. Ample time for natural recovery should be allowed before surgical correction is considered and before compensation claims are satisfied. Many cases require from nine to twelve months to reach a stable point.

Ophthalmological Findings in Injuries to the Neck and Chest, and to the Sympathetic Chain

Interruption of the sympathetic chain in the neck produces Horner's syndrome, first described by Claude Bernard and by Horner in 1869. This syndrome consists of miosis, narrowing of the palpebral fissure, enophthalmos, and ocular hypotony on the side of the neck injury. There is also loss of sweating and increased skin temperature on the same side of the face. Horner's syndrome is often incomplete. The miotic pupil reacts normally to light and accommodation. The pupil usually fails to dilate with cocaine which serves to differentiate it from a spastic miosis. If adrenalin is then placed in the eyes, the pupil on the affected side dilates more widely than the pupil of the normal eye.

Traumatic Retinopathy of Purtscher

It has long been known that following severe bodily injury, especially crushing chest injuries, a change occurs in the fundus of one or both eyes. This change consists of fluffy whitish-grey opacities in the retina which resemble exudates. These are associated closely with the retinal vessels and are frequently numerous in the macular area, but may be extensive and involve much of the fundus. They lie along retinal vessels, and the vessels may be hidden by them. They are usually associated with retinal or sub-hyaloid hemorrhages. The hemorrhages may be extensive and resemble those of retinal vein thrombosis. These findings usually appear from two to four days following a severe crushing injury.

There have been various theories as to the causation of the retinal lesions. Purtscher thought they were due to a rush of cerebrospinal fluid forced from the subarachnoid space through the disc along the paravascular sheaths of the retinal vessels. Other theories have to do with vascular spasm, increased venous pressure, and increased vessel permeability due to small rents in vessel walls as a result of concussion changes.

The actual mechanism of these retinal changes is probably varied and more than one factor may be operative. At the present time, it seems quite likely that in many of these cases fat embolisms play a role. Fat emboli have been found abundantly in the small vessels of the retina, optic nerve, and uveal tract in eyes with retinopathy of Purtscher.

Many of these patients die from the fat embolism or other features of their bodily injury. In surviving patients, the retinal lesions begin to fade away after four to six weeks and there are varying degrees of retinal deterioration which remain. In some cases, there is also optic atrophy.

Compression Cyanosis

In some crushing injuries of the chest or abdomen where there is a marked compression, as may occur when the body is pinned down by a heavy weight, a marked engorgement of the veins in the head, neck, and upper thorax, occurs. There is a dusky purple cyanosis of the head, neck, and upper chest, and sometimes of the upper arms. Edema is present and there are intra-cutaneous petechial hemorrhages. There is frequently proptosis due to orbital bleeding. Ophthalmoscopic examination shows a marked engorgement of the retinal veins with edema of the retina and many large retinal hemorrhages. Occasionally, blood is found in the anterior chamber of the eye due to rupture of some of the engorged vessels. Vision becomes poor because of the disturbance of the retinal circulation. The development of papilledema with severe loss of vision suggests the occurrence of bleeding into the optic nerve. An important factor in the production of this clinical picture is the absence of valves in the large veins above the heart. Some cases which have been called Purtscher's disease may have been compression cyanosis without the cutaneous manifestations.

From the ophthalmological point of view there is little to offer in the way of treatment unless emergencies arise such as secondary glaucoma from anterior chamber hemorrhage or corneal exposure due to exophthalmos secondary to orbital hemorrhage.

Bibliography

1. Blakeslee, G. A.: Eye manifestations in fracture of skull. Arch. Ophthalmol., 2:566, 1929.
2. Hooper, R. S.: Orbital complications of head injury. Brit. J. Surg., 39:126, 1951.
3. Turner, J. W.: Indirect injuries of the optic nerve. Aldren Brain, 66:140, 1943.

Accuracy of Routine Gall-bladder and Bile-duct Studies

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TABLE I. TWO HUNDRED CONSECUTIVE CASES, ORAL

X-Ray Report	Number of Cases	Pathological Findings				
		Number	Cholecystitis	Lithiasis	Tumors	Normal
Vis c Calculi	36	24	24	24		
Non Vis c Calculi	12	10	10	10		
Non Vis c out Calc.	31	21	20	17	1 C.D. 1 G.B.	
Normal 61 per cent	121	4	2	1		2

Read at the annual meeting of the Canadian Association of Radiologists, Toronto, Ontario, January 24-27, 1960.

SUFFICIENT information undoubtedly exists to confirm the dependability and accuracy of the radiologic diagnosis of diseases of the gall bladder. Several studies show this accuracy to be well over 95 per cent.[1,2] Statistically, then, the radiologist has developed a firm sense of security when rendering cholecystographic diagnoses. Consequently, in many cases, we have tended to allow the routine cholecystographic study to become a casual matter and because of this attitude may overlook lesions and perhaps do not give the patient the whole benefit of the procedures available. As radiologist in a small general hospital one is occasionally challenged by a colleague who is unwilling to accept a negative report in a given patient and at times even a positive report may be looked upon by him with some doubt. Stimulated, in part, by these occasions, it was thought advisable to review an unselected series of our cases to obtain at least a gross concept of the results and reliability of our methods of study. At the same time the methods of study could be reviewed, perhaps thereby providing better guides for our clinicians in the handling of their patients.

Methods of Study—Our methods of x-ray study of the gall bladder are based on simple routine procedures commonly used in all hospitals and offices. The patient is given the oral tablets in the evening after a light fat free meal and is brought to the x-ray department twelve to fifteen hours later. The material we have favored using over the past several years is Telepaque.[3,4] Ideally a plain predye 14 x 17 scout film of the abdomen should be made as a routine but as yet this has not been adopted into our routine.[5,6] Such a film is of considerable importance and on it one may often detect gall-bladder calculi, a calcified gall bladder, air in the biliary ducts or other abdominal lesions. When the patient reaches the x-ray department a scout film of right upper quadrant is made. If the gall bladder is not seen on this film, a full 14 x 17 abdominal film is made. This serves the purpose of locating the gall bladder in an unusual position; unabsorbed contrast material may confirm it was actually administered and retained; other unsuspected diseases outside the biliary system may be disclosed.

If calculi are seen on the scout film, the examination is discontinued. If one calculus is seen, a second film, probably in the decubitus position is made to see if the shadow changes position inside the gall bladder and thus make it possible to exclude a polyp.

Once the gall bladder is located, the detail studies follow. These include two oblique views and a decubitus view. This decubitus view is the most important of all the views.[7,8] It can be done with the existing equipment of most x-ray departments. The film is made with the patient lying on the right side with the x-ray beam passing horizontally through the gall-bladder area. The patient may be placed on a stretcher lying on his right side and the film made using the bucky of the upright x-ray table. This position will allow separation of the gall bladder from gas in the bowel, and many times calculi will be visualized which could not be seen on any other film. The erect study is rarely done as it is considerably less satisfactory than the decubitus view. A film after a fat meal is usually

done, not because we are interested in whether the gall bladder contracts, but because occasionally detection of small stones in the smaller volume of contrast material that is present after the contraction may be possible.

If the gall bladder does not function on the first attempt, we make sure that the patient had carried out the instructions, that the material can be and was absorbed, that it can reach the gall bladder, and then we repeat the examination usually the next day, but occasionally with a time interval. Analysis of our material reveals that only a few gall bladders that do not visualize on the first day, do so on the second. We still do "repeat" cholecystograms but we are not as insistent on them as we once were and occasionally will go ahead with other procedures rather than make the patient spend an extra day in the hospital.[9]

At the time these roentgen studies were made, we were not using pre-examination fatty meal or planography and we did not do any fluoroscopy or spot films of the gall bladder. We occasionally used a fatty meal at noon the day preceding the examination to empty the gall bladder. This allows one to be more confident that the gall bladder has space available to receive the dye.[10]

Another method we have used is the four-day Telepaque test. Some gallstones become visible by precipitation of contrast material on their surfaces after prolonged exposure to the contrast material.[11,12] This is true, particularly, in the case of biliverdin pigment stones. According to Salzman, this is a good method of identifying gallstones, and also bile duct stones "which will opacify in over 75 per cent of cases." To produce this prolonged exposure to contrast material, the patient is given one gram of Telepaque q.i.d. for four days. Following this films are made following the regular routine.

The gall bladder may also be examined by the use of intravenous contrast material.[13] The examination is carried out as for intravenous cholangiogram. The dye is concentrated by the liver and fills the gall-bladder through the cystic duct. This occurs as long as the cystic duct is patent. One can then evaluate the size and shape of the gall bladder and its contents. This test gives no information as to gall-bladder function but is valuable in confirming the presence of stones or of cystic duct obstruction. This intravenous method is valuable in the differential diagnosis of acute cholecystitis.[14] It is frequently difficult to differentiate between acute cholecystitis and acute pancreatitis and this is often an important clinical problem. Symptomatology and clinical findings may be indistinguishable and frequently both have a history of previous colic. Keeping in mind the commonly accepted pathogenesis of acute cholecystitis, that is, cystic duct obstruction, one should be able to opacify the gall bladder in the patient with acute pancreatitis, while in the patient with acute cholecystitis the gall bladder cannot fill because of the obstructed cystic duct. Therefore, if an intravenous cholangiogram is done, and this can be done independent of gastric intolerance or faulty absorption and in fairly short interval of time, the presence or absence of gall-bladder filling would assist one in making the differentiation.

Other methods of evaluating the gall bladder in cases of possible acute cholecystitis are based in the main upon the history of previous studies, which may have shown calculi or non-function with a double dose of oral contrast; or, in the case of patients who have had no previous studies, or have been normal previously, a plain film of the abdomen may occasionally be helpful as well as the intravenous dye studies.

Criteria Necessary for a Normal Gall-bladder Report.—

1. Concentration of the dye to any degree is considered normal.[15,16] Since only a small amount of functioning mucosa is necessary for concentration of the dye, some cases of cholecystitis do concentrate the dye and when calculi are not present would be interpreted as normal. This is the type of patient that raises the most discussion with the clinician. Final diagnosis depends on correlation with other clinical findings. However as long as there is concentration of the contrast with no other abnormal findings, we continue to interpret these gall bladders as normal.

2. No calculi or polyp shadows within the gall bladder.

3. No Rokitansky-Aschoff sinuses.[17] These consist of projections of the contrast shadow beyond the smoothly outlined wall of the gall bladder producing a somewhat irregular pattern. They are taken to indicate partial or intermittent obstruction of the cystic duct with subsequent back pressure.

4. No calcification in the gall-bladder wall. This of course may not be seen in a gall bladder that functions unless one takes a pre-dye scout film of the gall-bladder area.

5. The gall bladder may lie in any position, be of any size and configuration and still be normal.

6. Contraction or non-contraction of the gall bladder after a fatty meal is of no clinical significance.

Review of Cases. — The records of 200 consecutive patients who had had routine cholecystographic studies in our hospital beginning in January, 1954, were reviewed as to the x-ray diagnosis. In the spring of 1959, the hospital records of these patients were then reviewed to obtain information as to the medical course, subsequent admissions and pathologic correlation. Thus there was a time interval of from four to five years between the x-ray studies and the follow-up study.

Study of the 200 x-ray reports revealed that abnormalities were reported in seventy-nine cases (39 per cent). The gall bladder was visualized with calculi in thirty-six. In several where calculi were faint or very small, persistence in examination with the use of different positions and techniques had resulted in the correct diagnosis. This persistence was usually stimulated in me by the clinician who would refuse to accept a normal report. Twenty-four of these patients have been operated upon and all showed cholecystitis and cholelithiasis. This operative rate of two-thirds may seem low, but we live in a conservative community, and furthermore, many of the patients were aged.

In twelve cases, there was non-visualization with calculi; ten of these had surgery and all showed the expected pathological findings. In thirty-one cases there was non-visualization without opaque calculi. Twenty-one of these thirty-one patients were operated on and all showed pathologic lesions. There was one case of carcinoma of the gall bladder with stones, one of carcinoma of the common duct, sixteen with calculi and cholecystitis, three with cholecystitis alone.

Of greater interest are the 121 cases which were interpreted as having normal function without calculi. Four of these patients were operated upon with the pre-operative clinical diagnosis of cholecystitis. Two were found to be normal by the pathologist. However, only one of these had subsequent hospital admissions for abdominal trouble, the other patient being apparently cured. The third patient received a pathological report of "mild cholecystitis, no calculi." This patient has been in the hospital on three subsequent occasions with varying diagnoses such as functional dyspepsia and gastritis. The gastrointestinal findings are normal. The fourth patient is interesting in that the roentgen report was "normal function without calculi. The irregular and unusual shape of the gall bladder raises the suspicion of surrounding adhesions." The operating surgeon reported several adhesions and a small stone in the cystic duct. The pathological report was "the gall bladder is 9 cm. long, moderately thickened, and shows some yellow foci in the mucosa. Microscopic sections show cholesterosis and mild chronic cholecystitis."

Therefore, as far as the abnormal cholecystograms were concerned, no error in interpretation was found; most, but not all, were pathologically confirmed. There were two errors discovered in the 121 gall bladders interpreted as normal. Since only four of the 121 patients were operated upon, there is no way to confirm our normal findings in the other 117. However, several of these patients were found to have lesions elsewhere in the gastro-intestinal or genito-urinary tracts and were treated for these. Very few of the remainder, who had been found normal on other studies, have returned to the hospital in the interim.

The results of this review are consistent with other more comprehensive reviews that have appeared in the literature. It serves to confirm our faith in our methods of gall-bladder examination and in the criteria used in our interpretations. During the review of these cases, it was noted that several patients who had symptoms strongly suggesting gall-bladder disease, but with normal cholecystogram findings, turned out to have other serious lesions. On the other hand, in the presence of gall-bladder disease, serious lesions often coexisted. One must never develop a blindness to other lesions when calculi or nonfunction is seen, or persist in considering a faint shadow abnormal and not pursue other possibilities.

Intravenous Cholangiography

Evaluation of our x-ray studies of the bile ducts by means of intravenous cholangiography has not been nearly as satisfactory. Our intravenous cholangiogram is performed by the usual methods using Cholegrafin.

Criteria of Diagnosis.—

1. The size of the duct:[18] There are many reports in the literature which indicate that there is

a wide range in size. In large series of cases, the size of the unobstructed duct varies from three to 15 millimeters, whereas the diameter of the obstructed duct ranges from 8 to 30 millimeters. The range in size from 8 to 15 millimeters is one of considerable overlap. Since 50 to 60 per cent of visualized ducts will fall into this group, it is apparent that the size of the duct will not allow a distinction as to the presence of obstruction.

2. The duration of opacification:[19] To determine the duration of opacification, films are made at one and two hours. In the unobstructed duct the opacification is usually densest at one hour and then gradually fades. It is possible therefore to make a diagnosis of partial obstruction on this basis; that the density of the dye does not decrease in two hours from its maximum at one hour.

3. Filling defect: These are most difficult to detect due to overlying shadows and may require several projections.

4. Cystic duct remnant.

A review of fifty-two consecutive intravenous cholangiograms examined in 1957 and 1958 reveals that approximately 36 per cent of the examinations had such faint concentration of the dye that little if any information of value could be obtained. Of these fifty-two patients, forty-one had had a previous cholecystectomy. Of these forty-one, 46 per cent had visualization too faint to be of diagnostic value. Of course, in several of these the presence of clinical jaundice almost precluded the expectation of a good examination,[20] but since it was precisely in the jaundiced patient that one had most need of more information, the examination was attempted because occasionally helpful findings will be obtained. Also at that time we did not have laminography available. We hope to improve our results in the future with its use.

In about 19 per cent of the cases there was good enough concentration of the dye to evaluate two of our criteria; these were the size of the common duct, and whether or not the opacification persisted. However, in these cases it was difficult to exclude the possibility of filling defects or even of a possible cystic duct remnant.

In the remaining 34 per cent, concentration of the dye and separation from overlying shadows was such that definite diagnoses could be made with all four of the criteria fulfilled. Either the findings could be said to be normal or a definite abnormality was seen. Most of these patients were not jaundiced. The main complaint was usually vague post-cholecystectomy pain. Most of these patients were considered to show normal findings; none of these was explored but were managed medically.

In the abnormal cases, two cystic duct remnants were found; there was one case of common duct calculi and two cases of possible partial obstruction due to stricture but these last two are not proved. The intravenous cholangiogram did not often help us demonstrate stricture or other forms of obstruction because nearly all cases had appreciable jaundice and the ducts did not visualize.

I have been somewhat discouraged with what seems to be a low yield from our intravenous cholangiogram studies. However, since our colleagues still ask for this examination, they must feel that some value is being obtained. In our hospital, as in the larger reported series, the test is of most value in the post-cholecystectomy patient with pain or discomfort without jaundice.[21] In the obstructed cases, the value decreases considerably. Our visualization rate of 54 per cent compares poorly with the reported rates of 80 to 85 per cent. Since this visualization rate will depend on the selection of cases, that is, as the degree of liver damage increases, the rate of visualization will decrease, perhaps we have selected too many jaundiced patients. Also our results could probably be improved with body section studies which we will use in the future.

Summary

1. Our present methods of gall-bladder study and diagnostic criteria appear adequate.

2. Other serious diseases may mimic gall-bladder disease and may co-exist with gall-bladder disease.

3. Routine oral gall-bladder study deserves just as much individualization as any other examination. Consultation between clinician and radiologist is always of value and should be carried out in any questionable case.

4. Diagnosis and differential diagnosis of acute cholecystitis may be expedited by knowledge of previous roentgen studies, by plain film studies and by intravenous cholangiography.

5. Our bile-duct study yields could be improved by the use of improved techniques and by the more careful selection of patients.

(References are on Page 351)

Roentgen Diagnosis of Paranasal Sinuses

Presented at the meeting of the Minnesota Radiological Society, November, 1959.

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Malmö, Sweden

From the Roentgendiagnostic Department of the University of Lund (Head: Professor Sölve Welin), Malmö allmänna Sjukhus, Malmö, Sweden.

SINCE RECENT years have witnessed hardly any noteworthy strides in this field, and since I have no new tricks to show, there remains but one thing for me to do, and that is to give an account of how we usually perform the examination in Sweden, or to be precise, how we do it in the department of diagnostic radiology at Malmö.

It appears rather strange that while diagnostic radiology has been marching ahead during the last few decades, the diagnosis of diseases of the sinuses has, so to say, been simply marking time. The only explanation I can find for this is that advances in other fields of medicine have not placed new demands on roentgenology of the sinuses and that, at least for the time being, we can give the surgeons the information they require.

At the international congress in Munich in July, 1959, at which 921 papers were read, only one dwelt on the sinuses. That lecture was given by an Italian who gave an account of his experience with tomographic examination of tumours of the sinuses.

Before I discuss the technique we use in Malmö let me first describe briefly how we feel about tomographic examination of the sinuses. In cases of malignant tumours or suspicion thereof, we have used tomography as a supplementary method, but later we stopped doing so because we found it seldom gave any information over and above what might be obtained by ordinary roentgenograms, that is, a thorough examination with films in various projections and of good quality. If the roentgenogram shows bone destruction, tomography will seldom add further information. In those cases in which we were doubtful whether the bony walls had been involved, tomography did not give definite information. This does not imply that tomography might not occasionally provide useful information. Particularly in the examination of patients with cerebrospinal rhinorrhea and those in whom transphenoidal hypophysectomy is contemplated. Personally, however, I should never dare to replace ordinary routine examination by tomography, at least not in the investigation of clinically suspected cancer.

Owing to the complicated anatomy of the nasal region, examination of the sinuses requires films in several different projections. In the choice of projections, we try to find an optimal projection for a certain sinus and, at the same time, to judge the various sinuses on the basis of as many projections as possible. In addition, the projections should be such as can be readily duplicated on later check examination. We resort to the stereoscopic procedure in special cases, but not routinely. We use a Schönander skull table. In routine examinations, we usually take films at five angulations, of which at least two are taken with a horizontal beam. However, the information desired by the surgeon as well as the roentgenologic findings sometimes make it necessary to take further films at different angulations.

In the first projection, the patient is sitting upright with the forehead and the nose pressed firmly against the table which is angled at 30 degrees from the vertical plane and leans against the patient's forehead. The beam is directed horizontally and in this projection the radiograph offers a good means of studying the extension of the frontal sinuses in the coronal plane, their outline, and their division into partitions. Furthermore, it gives

good information on the basal parts of the frontal sinuses. We can also judge the ethmoids and the maxillary sinuses.

In the second projection the film is primarily intended to investigate the maxillary sinuses, and it is important that this exposure be taken with the mouth wide open and that the head is extended so far backwards that the tip of the petrous bone is projected below the floor of the maxillary sinus. This sometimes makes it necessary to increase the angle of extension by inserting a pad between the forehead and the table. The nose and the mouth are being pressed against the skull table, now angled 20 degrees from the vertical plane. In this projection, it is possible to see fluid levels in the sphenoid sinuses since they are projected through the open mouth. Proper, careful adjustment of the patients is necessary, especially if they are children. If the head is tilted or if the central ray is eccentric, or if the film is underexposed, the roentgenogram might give the erroneous impression of a density, especially of the maxillary sinuses.

Anatomic factors must also be borne in mind in the interpretation of a film. The relative thickness of the bony walls in relation to the size of the sinus cavity might severely impair the translucency of the maxillary sinus. It is obvious that alterations in the thickness and appearance of the vault bones as well as of the antral bones can to some extent influence the apparent translucency of the antrum.

On the ordinary lateral view, we can carefully examine the prevertebral soft tissue shadow. A pathologic broadening of this can be caused by a malignant tumour which is seen occasionally as an incidental finding upon examination of the paranasal sinuses. In recent years, this view has assumed special importance. In all cases of head injury and in particular in severe cases where the patient's condition will not permit removal from the stretcher, we supplement the examination of the head by a lateral view of the sinuses taken with the patient supine and with a horizontal beam. We have found that in fractures of the lamina cribrosa, fluid is sometimes demonstrable in the sphenoidal sinus, even in the absence of any detectable fracture line. This is caused either by blood or by cerebrospinal fluid, and we have one case in which we were obliged to take the films again after a few minutes and in which we could show that it was a question of a very profuse flow of fluid since the fluid level had risen considerably. It is true that we can only see this phenomenon in a small percentage of acute examinations. But when we did see a fluid level, it was of such importance that I thought it was worth while including such a film in routine examination of head injuries.

The standard projections include the conventional axial film. In this film, the ethmoids and the sphenoidal sinuses show up distinctly.

The increasing frequency of transsphenoidal hypophysectomy in advanced cancer mammae with skeletal metastases, has aroused interest in these sinuses. The sphenoidal sinus varies widely in its anatomy from one person to another, and especially in its relation to the sella turcica. The bony septum between the two sphenoidal sinuses is in the midline only in about one third of all persons. Anteriorly it usually runs sagitally, but further posteriorly it deviates in one direction or another. Sometimes it may terminate before the sella turcica, often at the bony canal surrounding the carotid siphon. The posterior margin of the septum does not coincide with the mid-line. This is important for the surgeon to know. In a few per cent there is also a transverse septum, which extends from the upper part of the anterior wall of the sella turcica down to the floor of the sinus. Such a transverse septum makes the work of the surgeon difficult because it masks the sella whose anterior wall is thickened and fastened to the septum. Sometimes the septum persists only as a flat rib on the anterior wall of the sella, and then it is called a crista transversalis. Sometimes only the medial part of the septum persists, and then it might be very difficult for the surgeon to orient himself.

It is obvious that a very thorough roentgen examination, sometimes with supplementary tomography, is desirable before transsphenoidal hypophysectomy, since such roentgen examination will facilitate the work of the surgeon considerably.

In ordinary roentgen examination of the nasal sinuses it is, however, particularly the frontal sinuses on which the clinicians want information because they are the most difficult to examine clinically. Unfortunately, these sinuses are also very difficult to evaluate roentgenologically. For appreciation of the frontal sinuses, we use a special projection, the so-called overshot axial projection. I have found that the reliability of the roentgen findings has in many cases been increased from the surgical point of view. In this projection the patient may be in a sitting or supine position with the beam directed submentovertically. The head is extended backwards so that the mandible is pro-

jected in front of the sinuses, and the beam runs along their posterior walls. In this projection the antero-posterior depth of the frontal sinuses can be clearly estimated both in their medial plane and their lateral extensions. Furthermore, the thickness of their walls can be evaluated, which is of great importance in the analysis of these pictures.

The varying degrees of translucency in the different parts of the frontal sinus in the postero-anterior projection may sometimes be so marked as to simulate a pathologic density and lead to an erroneous conclusion. This difference in translucency can at times depend on a different depth of the air volume in one sinus as compared with the other, and an abnormal bulge can give a similar difference in the same paranasal sinus.

We have also had cases where we might doubt whether there is any frontal sinus. These are the patients with pronounced unilateral osteosclerosis from an old inflammatory process with much bony proliferation. The bone structure may in the first standard projection be entirely homogeneous and almost as dense as normal compact bone. In such cases, through the use of the overshot axial picture, it is possible to determine whether the frontal sinuses are lacking or not. The view using the postero-anterior beam and the overshot axial picture are thus complementary and the projection is superior to the ordinary profile picture, when the depth of the frontal sinuses in their entirety is to be established. Despite the great improvement brought about by the introduction of the projection, cases are nevertheless still found in which radiology cannot with certainty establish, whether a frontal sinus is affected or not. Such cases are, however, fairly uncommon and they will obviously become still more uncommon with increased experience.

A density of the frontal sinus is sometimes seen with a rather distinct horizontal upper border in the basal part; it may be difficult to decide whether the change is due to the bone, a swelling of the mucous membrane, or a retention of secretions with fluid level. To arrive at a decision, we use the same projection as in the first frontal view, but the patient is now lying in true lateral position. This projection is, in our experience, of greater value than the oblique projection of other authors since it will reveal even the smallest amounts of fluid when other projections fail to do so.

The earliest sign of a pathologic process in a sinus is a thickening of the mucosal lining. Two main etiologic factors are responsible for this, allergy and infection. Both these factors may be present in any individual case and, although it may occasionally be possible to differentiate the allergic form from the infectious change, in many cases this is not possible. One usually says that a scalloped mucosal swelling, a marked degree of mucosal thickening, a polyp formation and hypertrophied and swollen turbinates suggest allergy. It should be remembered, however, that these signs only appear when sinus contains some air and in the completely opaque sinus it is not possible to differentiate these two states.

As far as the maxillary sinuses are concerned, it may sometimes be difficult to distinguish between polypoid thickening due to allergy and a large solitary polyp. In such cases, an examination in different projections and different directions of the beam may sometimes permit a differential diagnosis, a polyp being pedunculated while a non-secreting cyst is always sessile. But clinicians very seldom ask for a differential diagnosis, and we have therefore never found it necessary to fill the sinus with contrast medium. As a matter of fact, excepting operated cases in Sweden, we no longer use contrast injections in the examination of the nasal sinuses. Some years ago we still did so to differentiate malignant tumours, but since the method did not give really reliable information, we dropped it.

Signs of expansion and abnormal translucency are the two commonest roentgenologic signs of a mucocele, and there is usually no difficulty in establishing a positive diagnosis. Formerly, it was assumed that an increased density suggested the existence of a mucocele with sterile contents while increased translucency was a sign that it had been infected. But this does not fit in with our experience. Nor is it surprising since the increased translucency must be present in all cases where the bone walls have become thinner because of atrophy due to the presence of an expanding lesion. In other words, the density will not permit any conclusions as to the content of a mucocele. These processes are generally found in the frontal sinuses and ethmoids and they often look like rounded or oval cystic formations. However, they vary in shape, probably because of variation in the resistance offered by the bone. In some cases the pressure results in large bony defects.

Personally I am inclined to believe that the post-operative changes in the sinuses offer the greatest difficulties, especially where such patients are re-

ferred to us for suspected malignant neoplasm. We usually find a diffuse density with a greater or lesser operative defect, also usually a lack of definition in the surrounding contours. These changes are the result of operative and postoperative changes. It does not, however, permit any conclusions concerning the possible healing of the lesion. It does not provide any definite information concerning the possible presence of a soft tissue lesion.

In the case of frontal sinuses we cannot say anything concerning the patency of a recently constructed fronto-nasal passage. In such cases we may continue the investigation by the introduction of contrast medium into the nasal cavity, with regard to the roentgen diagnosis of the so-called secondary mucocele, arising in frontal sinuses previously subjected to radical operation. In the cases in which the fronto-nasal duct has remained open, the contrast medium runs directly up into the operatively treated frontal sinus. By examining the patient in different positions and always using a horizontal beam, it is possible to fill the different parts of the frontal sinus with contrast medium and to map the operative cavity. In the cases, where it is impossible to fill the frontal sinus with contrast medium through the fronto-nasal duct, the roentgen examination is continued with a direct puncture of the frontal sinus and injection of the contrast medium through the puncture needle. An ordinary needle puncture is obtained under local anesthesia into the medial angle of the orbit, approximately one centimetre from the midline and somewhat medial to the supra-orbital margin, at the site of the former trephine opening. A few millimetres of contrast medium is injected and if the frontal sinus is filled with soft tissue, a diffuse distribution of the contrast medium is obtained. If a mucocele is present, the picture varies according to whether the contrast medium is injected into or outside of the mucocele.

Finally, we come to the tumours, which is the most important field and I might just as well say now, that I do not know any particular trick to discover malignant neoplasms. The only thing we can do is to take films in a sufficient number of projections, to see that we get good film quality and to try to interpret the films as carefully as possible.

In addition to the standard projections I referred to just now, we always use one more projection, which we have found very useful, in the investigation of neoplasms. This film is taken with the patient prone with the chin and nose against the table and the tube angled towards the feet at 15 degrees. In this film the bony walls of the maxillary sinuses are very distinct and can be judged all the way round. The great wing of the sphenoid can also be examined, which is of great importance for diagnoses of malignant neoplasms in the retromaxillary region.

In the investigation of neoplasms we must first of all try to find out the type, their extent and if possible their origin. Of the benign tumours, osteomas are the commonest. Strangely enough, reports of surgical removal of such tumours are still being published. From a differential diagnostic point of view, fibro-osteomas are much more important. In these, pressure atrophy may be so severe that the radiologic picture can give the impression of a malignant neoplasm accompanied by destruction. Certainty can only be secured in such cases by biopsy. The knowledge of these conditions is of great importance from the differential diagnostic view-point since it is not possible to determine the nature of the process simply on the basis of clinical symptoms.

In malignant tumours, there is usually a complete opacification of the affected sinus by the time the patient comes to roentgen examination and there is nothing to distinguish it from opacification produced by fluid or thickened mucosa. One must therefore carefully examine the sinus walls for evidence of decalcification and destruction. The malignant tumours usually originate in the maxillary-ethmoidal angle and grow out towards the nasal sinus, the frontal sinus and orbits, or posteriorly towards the sphenoidal bone or through the posterior wall of the maxillary sinus out into the fossa pterygo-palatina.

Treatment of the tumour depends on how widespread it is. If the tumour is small and well defined, according to our experience the best results are obtained by combined radiotherapy and surgical therapy; only radiotherapy can be offered in a case with a widespread tumour. Pathologic bone changes of the great wing of the sphenoid and of processus pterygoideus imply that the tumour is too wide-spread to be extirpated from healthy tissue.

I have now set forth in brief our experience in Malmö. My views are of course coloured by my personal experience. It is obvious that these problems can be considered from various points of view, and what I have said is by no means exhaustive but should rather be regarded as a few points which I thought might be of current interest.

Advances in the Science of Communications as It Relates to Medical Writing

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Altered from a presentation at the American Medical Writers' Association Conference, Chase Hotel, St. Louis, Mo., Saturday, October 3, 1959 and published in part in Mississippi Valley Medical Journal, January, 1960.
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I HAVE MADE a systematic run-down of all the major communications sciences. I talked to a lot of people in New York and elsewhere, always looking for the new. Communications sciences fall into the broad categories of the physical and the psychological. I wish to stress what is new physically, and what fits the service of medicine in the three prime areas of (1) Medical Teaching, (2) Public Health Education and (3) Medical Public Relations.

Closed Circuit Television

Specifically, you will have to fit each topic into its useful niche. Closed circuit television, for example, is expensive, but it is amazing. A five-year-old science, it is burgeoning in use in commerce and industry. In fact, for the first time next week, the Army Quartermaster Corps will use it for auctioning off of surplus government equipment.

Originating from three locations, the Army Engineer Depot at Granite City, Illinois; the Air Force Depot at Shelby, Ohio, and the Philadelphia Naval Ship Yard, the eight-hour-long sale will be wired into auditoriums in New York, Philadelphia, Chicago, St. Louis, Columbus, Ohio; and Boston. A two-way audio circuit will permit the bidders at the six viewing locations to speak up.

You know how closed circuit television works. Via telephone lines, the audiovisual signals are sent from the transmission point or points to selected locations, usually theatres, auditoriums or hotel meeting rooms. Screens can vary from monitors, similar to your home TV receivers, accommodating an audience of ten to twenty persons, to a four-sided giant screen, each side measuring 50 by 65 feet such as has been used at Madison Square Garden in New York to reach thousands of people under one roof.

Closed circuit television is not a communications technique new to the medical profession. In 1955 Smith-Kline & French introduced their "Videclinic" to 20,000 heart specialists in thirty-five cities. Since then, there have been eighteen or twenty others sponsored by pharmaceutical manufacturers, the most extensive being that of Upjohn's "Grand Rounds," a telecast to 35,000 doctors in fifty-three cities; and with 200 kinescopes subsequently shown at local medical meetings, reaching an ultimate audience of 100,000 physicians, or about one-third of the U. S. total. A kinescope, as you know, is a motion picture copy of a telecast, suitable for 16-mm. projection.

A single maximum hook-up of closed circuit television could simultaneously reach three-quarters of the 226,000 M.D.'s in the United States. But who would pay for it? I am sorry I cannot furnish information on that too. But the president of SUNOCO, the Sun Oil Company, estimated that a $500,000 convention could be held via closed circuit television for $200,000.

An editorial in the *A.M.A. Journal* of January 1, 1955, said: "The increasing demand for refresher and other special short courses reflects a desire on the part of practicing physicians to receive well-organized, systematic presentations of new medical knowledge. However, physicians in both urban and rural areas find it difficult to absent themselves from their practices to attend

post-graduate courses without curtailing the effective medical care they render to their communities, to say nothing of the economic losses they may incur through the loss of practice and the expense of travel and maintenance while away." The editorial continues to say that television may "provide a solution to this problem as a medium through which medical centers can extend the walls of their laboratories, lecture halls, hospital wards, and clinics to encompass virtually all the physicians in the country."

It hasn't happened yet, but I am sure the ingenuity of the medical profession can find a way. And the advance of the science itself is making the finding easier.

If you want more detailed information on conventional closed TV you can communicate with Mr. Nathan L. Halpern, President of Theatre Network Television, Inc., 575 Madison Avenue, New York City. I mention this organization because they handle about 85 per cent of all closed circuit television in the United States.

Two-Way Telephone Circuits

Now here is a less costly way to accomplish something akin to closed TV, but at about one-fifth of the cost. A demonstration or illustrated lecture can be presented, and questions asked and answered with as many far-flung cities hooked up as you might want. This is executed with two-way telephone circuits, and a co-ordinated use of 35-mm. film strips, projected with ordinary equipment.

In each of the audience cities, a projectionist operates the projector, changing the frames at word cue or at an ultrasonic signal. Mikes and speakers are at all audience locations, so questions can be asked from any audience group, and answered from the demonstration city, or vice versa.

Such telephone hook-ups are arranged through the "long lines" department of the telephone company, but if you want further data I suggest you communicate with Mr. Robert E. Taylor, President of Research and Training Corporation, 331 Madison Avenue, New York City. They pioneered this system.

Pay Television

I'd like to make an interpolation at this point. My opening references to closed circuit television are related to what I wish to call to your attention now with reference to Videotape and pay television. Medical communications have two basic audiences. One is the profession itself; the other is the public.

In the first case, it is obvious that TV is an ideal medium for teaching because it can demonstrate simultaneously to masses of physicians. In the second case, the visual impact and popularity of TV are important, but more important, is the simple fact that more and more free television "time" is going to become available to the medical profession—for the purpose of promoting public health, and the important position of the physician in the community.

I shall talk about pay television first, and then about the electronic camera and Videotape. By way of preface, you know that Commercial Television is controlled by the Federal Communications Commission, and is required to devote a certain amount of its broadcasting time, gratis, to "public service" programming. Much of this time could be used to promote public health and the role of the physician in this vital area of national welfare; but to my knowledge at least, it hasn't been.

Now, pay television is coming fast, and while not subject to FCC regulations when direct-wired, it plans to devote one-third of its facilities to "public service" programming. Telemeter, Inc., a subsidiary of Paramount Pictures, has announced operation in five cities this autumn with a minimum of 5,000 wired homes in each city. There are other pay TV organizations like Skiatron and Zenith, and they appear to be moving too.

Pay TV, as you know, may be wired into the home, or broadcast. If broadcast, it is "scrambled" in transmission, and "unscrambled" at the receiver. Both wired and broadcast varieties are coin-machine controlled, so the viewer pays for what he wants to look at, and there are no "commercials." Because the broadcast variety will fall under FCC regulation, no doubt it will be required to give a certain amount of free time to public service programming, opening up more such time, in addition to what is available now from commercial television stations.

Telemeter

Telemeter, which will be wired directly into the home, and will therefore not be under FCC

control, will nonetheless devote one-third of its time to public service programming. Here is the way it will work:

Each home will be wired with three channels, as follows: (1) movies, (2) current events and (3) public or community service programs. The Telemeter subscriber will have to pay to see a movie, or a wrestling match, or what ever is offered on Channels 1 and 2, but Channel 3 will operate "free." Channel 3 will have a continuous showing of public service material, and will be used to announce periodically the coming "pay attractions" and the prices. This Channel 3 will be the one open to you, and it will require hours and hours of material.

Videotape

All this ties in with Videotape. You know how it works. Both picture and sound are recorded in magnetic impulses on acetate tape. Picture can be in black-and-white or color. Videotape made it possible in America to show hours later on television the historic exchange between Khrushchev and Nixon at the Moscow Fair. Videotape, unlike optical motion picture film, requires no developing. You can project the pictures immediately after recording.

A Videotape camera costs only about $1,000. The costly element is the recorder, the machine to which the camera is connected, which records the pictures and sound on the tape. A recorder costs about $65,000.

However, by means of telephone lines, a Videotape camera anywhere can be hooked up to a recorder anywhere; and very soon almost all TV stations will have Videotape equipment. A recent release reported that forty-three educational television stations have been equipped with Videotape recorders through a Ford Foundation grant. In addition to studio-located recorders, there are mobile units with recorders mounted on trucks.

Once a Videotape has been made, it can be shown on any TV circuit—commercial, educational, pay, closed or broadcast. Further, it can be converted into a kinescope, or kine, which can be shown with any standard motion picture projector.

I will have to leave up to your ingenuity and your resolution the application of the information I have passed on to you. But it seems to me that certainly a state medical association could afford to invest $1,000 in a Videotape camera. Possibly even a county chapter could.

I know many physicians who are handy with a home movie outfit. A Videotape camera is not radically different, cinematographically speaking. Certainly, co-operation can be sought from TV stations for recording arrangements. Any additional information you may want on Videotape equipment may be had from Ampex Corporation, 934 Charter Street, Redwood City, California.

The point is that every medical group in the country can gear up to build a library of Videotape recorded material that can be used in two directions: (1) to the public on public service TV time; and (2) to the profession itself through closed circuits and/or kinescopes. If, as and when the Pay TV circuits are working, it is possible that "selective use" of the medium could be worked out, so that on special occasions, professional demonstrations could be piped directly and privately into the homes of physicians only at an appointed hour. If you want to know more about Pay TV, you can write International Telemeter Corporation, 2000 Stoner Avenue, Los Angeles, California.

Organization and Economics

At this juncture, I should like to express several points of confusion, if not of amazement. I have tried to report to you new communications techniques, and do it in such a way as to indicate free, or at least relatively economical, means open, or opening up to you.

I have even asked: "Who would pay for it?" I have said many M.D.'s are pretty good amateur photographers, so maybe they could operate Videotape cameras. I have talked to you as if I were addressing a group of noble indigents like the Franciscan Friars; men with a good cause but no means.

Now, I ask myself. "Why?"

Let's take a long and honest look at medical communications, and what purpose they should serve, and who is really responsible for effecting them.

It appears to me that the medical profession itself, perhaps through the AMA, could effect a corporate attitude, holding that medicine, like a business corporation, has the responsibility for keeping up with technical advancements, and has a stake in its "market"—public health.

The question has been asked, "but who pays for it?" Pharmaceutical companies have done yeoman duty with closed circuit TV, but it must be admitted that what they have done has been slanted with self-interest.

If the medical profession could acquire the viewpoints of a service corporation, it could and would attack and solve the problems I have mentioned. If the real issues in medicine are such considerations as socialized medicine (and how to avoid it) and professional integrity (and how really to achieve it), then it behooves the medical profession itself to find ways and means to use new and appropriate communications techniques to cut through the competitive din of frequently contrived information often biased by self-interest, both in the area of postgraduate training, and of public health education.

Consider the corporate operation. Income is ploughed back into research, new product development, plant expansion, promotion — many various types of investments which insure the kind of public satisfaction which in a competitive society, and which philosophically, in fact, is the basis of existence for us all, and which is tantamount to serving at all.

As an example, consider the Columbia Broadcasting Company. This is a service corporation; it has no products, its function is vitally concerned with the public interest because it deals with the public mind. But it is controlled by the government, and criticized by all kinds of pressure groups and crackpots. Yet, CBS does not hope for solutions to its problems. It promotes itself, improves itself, makes sure that its corporate P&L statement is sound, and thinks constantly of the service it is rendering to the public in competition with NBC, ABC and other TV facilities because if it really fails to serve, annihilation is its destiny.

Is the medical profession actually in any different position? You can say, "Well, information, and certainly entertainment, which is a large part of TV, is not really essential."

So let us take transportation, as another example. Transportation is incontrovertably essential. You are all familiar with the vast sums spent by the automobile industry for research, development and promotion. For what reason? To make a profit? Of course. But in the process, to serve the needs of people who must have transportation to live, work, maintain the economy and enjoy themselves. Are the aims of the medical profession different?

I am not clear about the distinction between the so-called "professional" and the so-called "commercial" endeavors. Certainly, the physician may not take liberties with the life and limb of his patients without violating his code of ethics; but neither may a motor car maker manufacture an automobile with square wheels without violating his code of ethics, as well as everybody's common sense.

Speaking of money, there are 226,000 physicians in the United States. I have not taken the time to ascertain the average income of doctors, but guessing, if it is $20,000 a year, then aggregate income totals $4,520,000,000; if $10,000 then $2,260,000,000. Few corporations spend less than 1 per cent of gross income for advertising and promotion (not including research and development), many spend as much as 20 per cent. One per cent of $4,520,000,000 is $45,000,000; of $2,260,000,000 it is $22,000,000.

Can you say, "Physicians, collectively, are not a corporation"? If so, then am I to conclude that because there are 226,000 physicians there are 226,000 medical corporations?

In the world of commerce, there is an answer to this too. There are associations in business—I'll cite the California Fruit Growers Association, just to name one—that do function like corporations, as cohesively, as intelligently, as efficiently, as profitably. If they didn't, their members, as individuals, would be stunted, if not annihilated.

I was going into other frontiers of "new advances" in the science of communications. I am especially interested in the psychological sciences such as ESP, subliminal communication, adult motivation through children, Freudian manipulation, symbolism and other techniques, some somewhat proved and some totally unproved. We use them with varying degrees of success in advertising, and I believe you should take a second look at all of them, for certainly "selling" medical care and family health are just as important to the nation as selling corn flakes, soap or filter cigarettes. But whatever the product, the "sell" must be strong and clear and "motivating."

If you think what I have talked about (even without getting into weird psychology) is *avant garde* akin to Jules Verne, or Buck Rogers, just bear this in mind. Unless they lied, or we can contradict them, there's a Russian hammer-and-sickle insignia on the moon right now. Who says I'm ahead of my times?

Preventive Psychiatry—Present Status and Future

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III

This section will discuss and evaluate the techniques used in the application of mental health principles to the detection and prevention of mental illness, followed by a discussion of the application of these techniques to the various key groups in our society in which any preventive program must be applied. The need for a corrective emotional experience besides a logical and didactic explanation has been mentioned as necessary for any successful program of mental hygiene. The basic objective of such programs is to modify attitudes and unhealthy behavior secondary to unhealthy attitudes, and this is essentially an educational process where one person feels or recognizes a need, and another has a special training or background which can help fill the need. It is thus seen that the main instruments used in mental hygiene programs are not specialized laboratory equipment but specialized personnel. Some of the strengths and weaknesses in the personnel used are pointed out:

1. The psychiatrist, being a doctor of medicine initially, has normally taken at least three years of specialty work. Until recently, all this time could be spent in a mental hospital with the American Board of Psychiatry and Neurology only requiring six months' work in an out-patient setting.[31] Psychiatric training in itself does not necessarily mean the individual qualifies as someone effective in the role of a preventive mental hygienist. Depending on the place of training, there might be little instruction in psychology, anthropology, and related social sciences, and none on the growth and development on the normal personality. Until a short time ago there was little opportunity for the psychiatrist to take an active communal role since most mental hospitals were put in rural areas and "isolated" as much as possible, and the remainder of the medical profession did not seem ready to admit this specialty into the role of guiding and setting up principles of desirable behavior, let alone the general public. Most psychiatrists have thus had little public health training or experience, and they are not all equipped to understand the epidemiological and statistical methods a mental health program needs. There is also such a thing as an "epidemiologic temperament" in which one must be as objective as possible relying on one's reason for progress, while a "psychiatric temperament" must have more dependence on intuition; the latter predisposition with psychiatric training can produce difficulties when psychiatrists practice in the public health field.

At the present time, much preventive psychiatry is being done by people not specifically trained in this area. Well-trained psychiatrists and psychoanalysts speak on mental hygiene without any knowledge of education or the techniques of mass communication. Conversely, other people working in this area often use psychiatric and psychoanalytic theory without being aware of their meanings and implications.[32] Despite these limitations, the psychiatrist is usually the person expected to assume the leadership role in mental health programs, probably because his medical status gets more response from the medical profession and more acceptance from the general public. It must also be remembered that the role of the psychiatrist has changed immensely in the past forty years due to several factors such as two world wars and the Korean conflict that brought out the great amount of disability due to emotional problems. The contributions of psychoanalysis not only as a method for the study and treatment of personality disturbances but as a means of research into the nature of behavior as such, the increased awareness of the public towards emotional disorders and the contributions of psychiatry, the development of psychosomatic concepts of physical illness that have brought all the traditional concepts under review from a new orientation, and the success of public health measures in the control of infectious diseases has pointed out the need for progress in the field of mental illness to the involved professions and the public at large. At the

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present time, the problem is one of getting enough qualified psychiatrists to meet the ever-growing demand for psychiatric services, not only with hospitalized and non-hospitalized patients, but as administrators, superintendents and in subspecialties such as industrial and forensic psychiatry, as well as in child psychiatry where forty new men are trained each year at a rate that would take fifteen years to staff the 600 clinics thought needed even excluding the residential treatment units.[33] The 1958 *American Medical Directory* lists 6,249 psychiatrists in full or part-time specialty, and estimates put the deficit at 50 to 100 per cent; about 550 new psychiatrists enter the field each year which would take twenty years to double the present number ignoring increased demand from population growth alone. From this picture, some have advocated decreasing the demand by encouraging people not to seek professional help for the minor discomforts of life like headaches, insomnia, irritability, nail biting, social drinking, et cetera.[34] It is from these facts that much responsibility for preventive mental health must be shared and shifted to other professional personnel.

2. Psychologists have a useful role in any mental health program, but here the wide variation in training is again prominent. There is variation present from the different academic settings where training takes place, and also by the degrees from the Ph.D. in clinical psychology to those with little clinical or outpatient experience. Clinical psychologists have a good background in research methods and design, and with greater emphasis on having all its members holding a Ph.D. degree with at least a year of clinical training, they have much to contribute. He is often well-trained in evaluating and meeting community needs from his role as psychological consultant, psychotherapist, and his research in various aspects of personality functioning in health and disease.

3. The psychiatric social worker has had two years of specialized training for a master's degree, and has had much emphasis on the intricacies of interpersonal relations with families and in other group settings. Through her interviews with families, it was found she could change their attitudes so they could better assist in the therapy of a patient, and plan for the return home of a hospitalized patient. In dealing with children, it has been the customary function of the social worker to treat the parents while the psychiatrist handled the child, thus giving him or her a unique opportunity to see family organization or disorganization, and how pathology in a parent laid the groundwork for mental illness in a child and how such behavior could best be modified. The expanding position of the psychiatric social worker is allowing an increased opportunity for them to take a more active part in mental health activities by participating in the educational and training programs for other professional personnel, such as medical students, medical and psychiatric residents and nurses. They can contribute the effects of social and economic stresses on patients and their families, and what is or should be available, the nature of social, health, employment, recreational, educational, vocational, legal and other resources in the community. Again, the capabilities of the individual social worker will largely govern her contributions.

4. Public health nurses working in the mental health field have been in existence only since 1948.[35] They have at least one year of special training beyond their R.N. and baccalaureate degree, and the nature of the training varies depending on where it is taken as some schools have different programs, some emphasizing public health sciences, others nursing supervision, or social work; all of them do tend to stress growth and development, and community facilities for dealing with mental health programs. From the short time these specialists have been in operation, the exact roles and accomplishments are not yet determined. It appears that they act as consultants to staff members on problem cases, decide if special referral to psychiatric or social clinics is needed, orient new nurses toward the mental hygiene objectives of her department, teach in local health departments about psychiatric clinical services available, and prepare nurses to teach the community how to use its psychiatric resources more effectively.[36]

5. Public health officers are usually physicians trained to deal with disease and promote health on a community level. They have had much training and experience in putting health programs into action. Inasmuch as their responsibility is for public health, they have a logical and contributory role to play, although some psychiatrists seem to feel that mental health is a separate area from public health responsibility.[37] Some even believe that the state psychiatric hospitals

with a pool of psychiatrists should be responsible for state mental health programs. However, the need for public health people is apparent when the differences between pyschiatric treatments and mental hygiene are noted, as well as the different job of administrator and public education. As mentioned above, in many communities the psychiatric hospital is isolated from the community, as was the psychiatrist from the medical community until recently, and thus the public health departments have a vital contribution to make.

6. Psychiatric nurses usually function in a hospital setting, but their influence on mental health may be important not only there, but in their other duties such as administrators, educators of nursing students, and coordinators of occupational and recreational activities. Although most nursing schools now include some work in psychiatry in their training programs, there has not been any decrease in the pathetic shortage of nurses in mental hospitals, and the need for graduate training in this field and something to take the place of the now deserted state hospitals system of producing psychiatric nurses is needed. Occupational and physical therapists also have roles in mental health similar to the psychiatric nurse.

It is seen that the use of different types of personnel, each specialized, is utilized for putting ideas into effect with populations. Meeting the public at the local level is the crux of their job in preventing mental illness, and this is done in cooperation with various health department personnel, the functional arrangements of which will not be discussed. In many fields of public health, the police power may be used to secure ends, such as in environmental sanitation and immunizations, but preventive psychiatric programs have many more similarities with programs for the early detection and prevention of cancer, that is, they must be based on teaching and persuasion, inducing a state of mind in the public that makes it want to carry out scientifically demonstrated and recommended practices, and this involves altering attitudes. Although the administrative details of organizing a community for a mental health program will not be covered here, it must be said that "the essence of public health at all levels is the building of an understanding of influential persons as to what it is about and why."[38] One of the most important influential persons to have in any program is the general physician whose support or rejection can make or break any program as his enthusiasm carries the mental health principles into his practice and influences his patients and their families, and in turn their children, relatives and friends. This is of added significance when it is realized that the vast majority of people whose health care requires some psychiatric understanding will never see a psychiatrist, but will see a general physician and receive whatever psychiatric help he can give them or get them.[39]

Before the techniques used in mental hygiene are discussed, a few fundamental principles should be stated. It must not be thought that all the various approaches used are ends in themselves as their effectiveness is only to be judged by the success they have in altering basic attitudes inimical to mental health. As Zilboorg has stated, "We commit a serious methodological mistake when we assume that ideas as such may serve as promoters of mental health. Even ideas about mental health cannot do much because ideas are not movers of instinctual forces but rather their representatives. . . . Man's overestimation of his own intellect has become combined with our recent overestimation of psychiatry and thus led us into a methodological path which is extremely popular and just as extremely devoid of scientific validity or practical potentialities."[40] Thus, it cannot be assumed that discussion groups and just talking about behavior problems and mental health have ever accomplished anything; it depends on the content of the discussions, and more important, with what intensity of feeling and sense of identification the discussion goes forward. This implies that the goals of mental health programs must be clear because the techniques are always subservient to this end. Leadership for the various programs will have to come from the specialized personnel mentioned previously, along with key community figures. Some of these people will be more effective than others in achieving their goals, and for some, certain approaches are more effective, such as working in small groups rather than with a large audience. It is well known that in any general educational process the more emotional the involvement that can be aroused, the more intellectual curiosity will be stimulated. In mental hygiene work, the effect on attitude is not just an aid to learning information, but one of the ends of the process. Thus, it is not the objective for parents to find out that their children will go through a period of negativism and stop there, but they should "attitudinally" accept this as a step toward

adulthood and individuality and appreciate that their child has a developing personality for which they have a responsibility.

Some of the accomplishments and shortcomings of the different techniques used should be mentioned.

1. Pamphlets are a well-established method attempting to influence the public. In regard to the success of getting people to read these pamphlets, it may be countered that no one has proved how effective this is despite the factual evidence of large numbers of pamphlets being read. This technique appears to have most of its effectiveness when the publications are directed specifically at a particular audience whose needs are known, such as the attitudes of pregnant women about their pregnancy and future child and publications for parents on the behavior and needs of children at different age levels. However, for people with behavior problems reading a pamphlet may not be enough to get them to recognize their pathology, or seek help if they do.

2. Posters can be mentioned as a form of modified and abbreviated pamphlets. All the criticisms directed at pamphlets apply here and more so. It appears that their main effectiveness is in raising money, but they may on occasion be a stimulus for taking some action.

3. Books are similar to pamphlets, but the wide variety available make them more adaptable to specific groups and thus more effective. Guide books on child care and behavior are usually effective in a mental health role in that they eliminate baseless anxiety and thus a stress upon the parents that could contribute to mental illness at some time. The effectiveness of books that attempt to explain behavior by a theoretical psychological theory is questionable and those that use psychiatric terms, such as the defense mechanisms, may merely increase the facility the reader has in using catchy terms without recognizing the unhealthy use being made of such mechanisms or how to control them. The probable worthlessness, despite their great popularity, as evidenced by best-seller lists, of books that advocate some psychological hobby or mechanism to relieve tension and increase happiness is disturbing. Just confining ourselves to those written by seemingly sincere people, they are based on the conclusion that techniques that give the writer comfort must help everyone in the same way. More damning is the way these uncritical ideas are exploded on the public by high-pressure advertising and sales promotion; if only a part of the money used to promote the sales of these books and the money spent on purchasing them could be diverted to mental health research, progress would be in order. The damage they do on an individual basis is also important as for the person whose whole effort and persistence are devoted to keeping a precarious, borderline adjustment, reasonably satisfying to himself, the "rah-rah" attitude of such books may be disquieting and contribute to "negative thinking."

4. Newspapers and magazine articles vary from worthwhile to the sensationalism that equates psychology and psychiatry with sex. The articles are effective so far as they alter harmful attitudes or stimulate the need to alter them; they may also have a role in undertaking reforms when needed, if this can be done without undermining the morale of the involved agencies.

5. Radio and television are communication media par excellence for reaching the public and involving them emotionally during the learning process. It is not the emotional involvement for its own sake that is the objective as all good and many poor films and plays do this, but it is hoped to get the audience identifying with one or another of the characters so that each member lives through an experience as if it were his own. The more this identification can be promoted, the more effective the program is in terms of altering attitudes and behavior. Television has the advantage over radio in this regard in that it shows the actor or speaker and makes identification and consequent emotional involvement more complete while the whole range of gesture and expression may also be used. Speeches and lectures are the least effective method of presenting content and molding attitudes, while a play performed by skilled actors with a strong illusion of reality is the most effective; these may often be reinforced by having a nationally known figure comment on the play at the end, pointing out its lesson and the need for its being taught, or simply lending prestige to the presentation. Documentary presentations with a mental hygiene theme usually get large listening audiences, but aside from this, their effectiveness needs more evaluation. A recent study evaluated the reactions of approximately 15 per cent of the population of the United Kingdom to a television series dealing with mental illness; the positive results obtained

were the spread of knowledge on the treatment of mental illness with an increase in the confidence that doctors could cure mental illness, and also an increase in the willingness to associate with the ex-patient.[41] There is evidence that communications to the general public are least effective when they raise a high amount of anxiety in the listeners, and solutions to the problems raised are not suggested. High anxiety messages *per se* tend to depress public interest.[42] Spot announcements are probably better adapted to getting contributions than to teaching. Discussions following performances of plays are often very useful in that members of the audience can identify first with one character and then another, and from the fact that they are not really the characters, a level of objectivity may prevail that usually leads in the end to a rational yet "feeling" solution of problems presented.

6. Motion pictures are very similar to television and range from maternal neglect of the newborn to the feelings of rejection of the retired, skilled workman. When used for evocative purposes, it was found that discussions were needed as the audience often left tense and guilt-laden. Discussion allowed observers to recognize that others have feelings like themselves and feel anxious because they could not achieve the satisfactory attitudes usually portrayed at the end of the films. A good discussion leader is essential to focus attention on certain aspects of the film, and recognize the personal emotional involvement in the various discussants and bring out how others have similar feelings. At times, the leader must curb a situation that is becoming too intense emotionally or that is becoming embarrassing or is overexposing the personality needs of someone, and similarities to group psychotherapy are then obvious. The effects of films are difficult to evaluate because it is easy to detect if the audience enjoyed the film and discussion, and if they were emotionally involved; but if a significant change in their future behavior has occurred is debatable, although most authorities seem to agree that a lasting effect has been created in a good proportion of the audience.

7. Lectures allow very little audience participation, yet they can be effective in allowing a large audience to see and hear a popular figure support some theory or popularize an idea. This is an excellent medium for the rational, unemotional presentation that has a place in mental health education although it must be supplemented by the techniques discussed above. Once again, objective evaluation of the effectiveness of this technique is badly needed.

8. Discussions have been mentioned along with motion pictures, and they may also be used with a parent-teacher group, churches, women's clubs, et cetera. These can range from the non-directive type with the group formulating its own ends as it moves along to a more structured discussion with various topics to be covered and summaries of progress. Crucial to the success of discussions are highly skilled leadership, and although it is often said that failure of the discussion or dropping out of members is due to sensitivities of group members, poor leadership is probably just as important. It is believed that small groups, meeting at regular intervals are the most efficient technique for learning the insights into behavior and attaining attitudes needed for satisfactory living. These various means of changing attitudes to promote mental health all involve the effect on the individual listener or participant, and it must also be mentioned that other personality molding forces are present in our cultural, sociologic, economic and political areas that affect people directly or indirectly through their parents, and changing these forces via the techniques mentioned here is not envisaged. For the people with deep emotional conflicts, the importance of general physicians cannot be underestimated as it is through them that such people can be directed to psychiatrists or agencies and an attempt made to stop the passing on from generation to generation, both longitudinally and horizontally, the behavior problems that plague them.

IV

In this section, a brief consideration will be given to the various key ages, groups, and institutions in our society where the prevention of mental illness must be effective if any program is to be successful. In the pre-natal period, the prevention of mental illness should be approached on both an organic and functional basis. For the former, public health measures are of prime importance and should have as their aim the prevention of maternal nutritional deficiencies, prevention and proper treatment of toxemias and medical conditions in the mother, avoidance of contact with rubella patients or use of gamma-globulin when exposed. It is also believed that some cases of behavior problems may result from

brain injury due to complications of pregnancy and childbirth, such as eclampsia, neonatal asphyxia and birth trauma. A recent study from Baltimore compared the birth histories of 1,151 behavior problems with 902 matched classmates from public schools and found significant abnormalities of the prenatal and paranatal periods in the former which they hypothesized as due to minimal brain damage.[43] The emotional attitude of the parents is also important during a pregnancy, particularly in regards to the effect they may have on the future life of the child and in respect to the current and future relationship of the parents toward each other. This is a fruitful area for educational efforts since the emotional relationship is clearly present and often recognized in respect to fears the mother has about her capacity for being a mother, sexual and other relations with her husband during pregnancy, and caring for the newborn.[44] Pre-natal clinics are a suitable and logical place for such discussions to take place, and these usually include the question of sex education for older children in the family and the almost inevitable sibling rivalry.

Well-baby clinics have a role in mental health promotion up to the time when the child enters school. The physiologic and emotional changes going on in this period are monumental as in this period the child changes from the dependent, incoordinated, helpless infant to a relatively independent person who should be capable of spending some time out of the home, and who can act and plan in a purposeful manner. All the requirements needed for healthy growth and development will not be mentioned except to say that the well-baby clinics are a place where a great deal may be done to promote this. Most pediatricians and psychiatrists now seem to feel that "rooming-in" procedures lessen maternal anxiety about infants and gives the infant more attendance to its needs than when it is put in a nursery. It is also believed that this promotes ambulation earlier by the mother and has an effect of decreasing the incidence of post-partum depression. The needless anxiety and feelings of failure produced in mothers who were unable, or did not desire, to breast feed due to the recent crest of popularity, now seems to be happily waning. Although there is not definitive proof that a mothering figure is needed for healthy emotional development, the evidence is in its favor and no one has suggested the absence of such a figure as a model for raising children. There is also much to suggest impaired parent-child relations contribute to mental illness, but it is not believed to be the role of a non-specialist to pry deeply into the unconscious factors at work, but rather to refer to child guidance clinics or private psychiatrists if this is indicated. A physician can offer parents a reassuring relationship regarding their adequacy as many parental reactions are the result of excessive anxiety, and he can also offer children a relationship with a non-relative who has prestige and who recognizes their existence independent of their parents.[45] Many varieties of childhood schizophrenia are now being recognized with the most common clinical picture showing maturational lags, autism, pan-neuroses and paranoid psychopathic behavior.[46] The problem of differential diagnosis in such cases between congenital defects, brain injury or emotional disturbances may be very difficult. Bender points out that it was the hope of workers in child guidance clinics to reduce delinquency and disturbed behavior in youth, and mental illness later, by preventive work in these clinics, but there is no statistical evidence that this has been accomplished. She believes the clinics have served a useful role as a place for parents, teachers and child workers to go for discussion and guidance with their problems, and as a diagnostic center that may offer special clinical facilities for epileptics, reading disorders, cerebral spastics, retarded children, and short term treatment of acute childhood problems.

Increasing knowledge of personality development has tended to stress the general family atmosphere more now than the specific behavior of parents, and the extent to which educational programs can modify the family atmosphere is a matter of controversy. No study has yet shown a reduction in the incidence of any personality disorder following educational programs for parents.[47] It would be possible to experimentally detect if differences in parental attitudes and behavior with respect to children really modify the incidence of neuroses and psychoses by evaluating different culture groups that have varying parent-child relationships. This would demand three formidable technical advances: (1) There must be studies of actual child-rearing practices unaffected by assumptions drawn from the nature of adult personalities but based on direct observations. (2) A distinction must be made between mental illness and the assessment of mental illness by different cultural groups. (3) There must be an adequate

technique for determining who is ill in different cultures.

The mental health of the school child is a subject that has been written on voluminously although often with a superficialty and too much controversy. It is estimated that 1 per cent of all school children need psychiatric treatment of severe symptoms, and 10 to 20 per cent need careful diagnostic work of lesser symptoms at some time in their school career.[48] Allowance must always be made for the child who does not fit within the range of standard deviations for "normal," particularly in regards to speech and reading disorders and those slightly below average mentally so that conduct disorders and frustrating failures may be avoided before they occur. Most educators would undoubtedly agree that the aim of education should be to make experiences and knowledge lead to a strong personality structure besides the factual knowledge gained. The best way of doing this is believed to be by selecting teachers whose good mental health will serve as an example for the children to identify with, and training teachers to have an understanding of emotional growth and development. It is apparent that these criteria are not often achieved especially in a period of teacher shortage and population growth. Various techniques have been advocated for promoting mental health in schools, such as student counselling, visiting teacher systems that get social workers into the field, and human relations courses that discuss emotionally charged situations. It has been recognized that young children operate more on the basis of affect than intellect and certain factors in classrooms help to avert emotional conflicts such as keeping the room pleasant materially, having friendly teachers who encourage friendliness among the children, helping the child to feel personally significant, and having a teacher sensitive to children's feelings. There should also be opportunity for children to express their emotions via writing, art and music, dramatics, physical play, reading and discussions. Some also advocate instruction in principles of human relations and behavior at a level appropriate for the age group.[49]

More controversial is the matter of incorporating sex education in classrooms as this is an area where most teachers and many parents are unaccustomed to face issues directly and are consequently unprepared to face them with children. It is apparent that methods of teaching mental health education are not standardized, and there is a need for much effective research. A study involving 350 school systems across the nation revealed 80 per cent had no classroom discussion of mental health, 85 per cent of the schools where it was discussed had no staff personnel trained in mental hygiene, and in 17 per cent of the schools there were no mental hygiene services of any kind.[50] Until such knowledge is available, a compromise must be adopted with the responsibility on the teacher for pushing some children as needed, pulling others and referring those that need it.

With such crucial responsibility, it is apparent how a teacher can easily foist many of her own emotional problems on to her children and every way possible for ferreting out such teachers must be pursued. In view of the teacher shortage, it may be better to have larger classrooms temporarily than allow children to be reinforced in their emotional handicaps. It is not enough to say that the per cent of emotionally disturbed teachers is less than their percentage of the population as their influence is exerted on millions of children in their classrooms. Using the most conservative figures available from studies in this area it was determined that 9 per cent of teachers were in need of psychiatric care,[51] and 25 per cent unhappy enough so they would not go into teaching again.[52] From these figures, approximately three million children are exposed each day to teachers distinguished sufficiently so they should not be around children. Experimental work has shown that mental health workshops for parents and teachers under the direction of a psychiatrist or a dynamically oriented psychologist are effective in changing attitudes and achieving rewarding results on psychologic tests, and such studies are an example of how scientific methods can be applied in evaluating mental health techniques.[53] Dr. Stevenson points out that although health has been at the top of all lists of educational objectives for the past forty years, it has not yet received the attention it merits, and mental health suffers more than any other part of school health work. In summary, efforts should be made to promote mental health in schools for all children by remedying unhygienic attitudes of some staff members, undemocratic procedures in the administration of schools, exposure of children to too much or too little stimulation, and prejudicial community attitudes that infiltrate the school. The mental health of college students has also been an area receiving increasing attention although the need for such special selection

from others in their age has not been adequately demonstrated.

Almost everyone is aware of the great increase of people in the seventh, eighth and ninth decades so the numerous statistical studies will not be cited. It is also being realized that longevity for its own sake is hardly a worthwhile goal. The mental health of the aged is a voluminous subject and only a few factors relevant to the prevention of mental illness will be mentioned. It is often a subtle problem in differentiating mental abberations from eccentricities and having to decide if impaired memory, labile emotions or disorientation need care in a mental hospital or can be managed in a rest home.[54] Many of the psychoses of youth and middle age reappear in later life, and thus an awareness of past mental conditions can often alert the physician to mental illness. Many psychologic abnormalities are produced by the increased susceptibility of the old patient to drugs and nutritional deficiencies which can be prevented. The emotional needs of older people do not differ greatly from others although their distorted perceptions, goals and activities make it difficult for others to see what they want or are trying to get, producing an indifference or hostility of family, community and physicians stemming from the anxiety and resentment aroused by the helplessness and apparent lack of resources of the elderly.[55] There is much room for improvement in constructive mental health programs for old people, and there are many ways these people can be helped to lead a satisfactory life with prevention of mental breakdowns to the benefit of themselves, their relatives and the tax-payers, but prevention must start years before as it had been shown statistically that poor, foreign-born, uneducated, unmarried, non-white urban dwellers are more likely to be hospitalized in later years.[56] The mental health problems arising from old age itself are only part of the problem as those problems due to dependency and the present make-up of society also contribute.[57] The value of pre-retirement counselling has not been appreciated along with the need for developing new interests, activities and participating in community life at recreation centers, Golden Age Clubs and church activities, but without a foundation being laid for such activities much earlier than old age their effectiveness must be questioned.

With all the recent talk about industrial hygiene, it is interesting to see how little mental hygiene has actually been incorporated in such programs. This may stem from the goals for which such plans as do exist are devised, for they seem to be primarily interested in obtaining increased production from workers by various means such as improving worker and management motivation, building morale, and decreasing labor turnover, accidents and absenteeism. This appears to make the psychiatrist and allied personnel members of management and raises suspicion in many unions who fail to see that better mental health has as a by-product increased production. Some would say that the answer is for unions to undertake this responsibility, but few unions have done so, and many argue that this should be a joint responsibility of union and management similar to many of the health and welfare funds now in existence.[58]

Industrial psychiatry will and should undoubtedly play a larger role in future mental health programs since it is no longer a question as to whether someone will deal with the emotional problems of workers, and collective bargaining will settle problems in this area as with other labor-management problems. The many problems in industry with emotional overtones include absenteeism and turnover, accidents and their sequelae, alcoholism, disability, motivation and rehabilitation, problems of promotion or lack of it, fatigue and impaired work output, occupational dermatoses, psychophysiological reactions, reaction to new employees or shifts within the company, besides the people with psychiatric problems that one industrial psychiatrist estimates to be at least a quarter of the working force.[59] The fruitfulness of mental health programs in this area is apparent. Special areas in which mental health programs may be undertaken, along lines mentioned previously, are premarital counselling, counselling in cases of threatened separation or divorce, and advice to parents on adoption. Whether such programs actually prevent neuroses or promote better family life for the children and involved parties has never been adequately demonstrated although current tension situations may be relieved. With medical advances of the past few decades problems are arising not only in the rehabilitation of people with some physical disability but also in regards to their emotional adjustment. Thus, the cardiac patient, young or old, must make certain adaptations or suffer because of it, and it is in these adaptations that the patient may fail. A child with a cardiac condition may easily develop without the give and

take of childhood necessary for personality growth, and this is often aided and abetted by parents and relatives who have received inadequate advice in this regard from physicians. The adjustment of the hard-driving, middle-aged man following a coronary is another fertile area where emotional frustrations and disappointments can lead to a self-pitying, unproductive life that can be prevented by proper techniques of rehabilitation, physically and emotionally. Another chronic condition with many psychic overtones is tuberculosis even if the controversy about emotional factors leading to a relapse is ignored. The imposed dependency and long hospitalization required often produce many problems in mental health. It is believed that 40 to 60 per cent of discharges from tuberculosis hospitals are against medical advice, and much of the responsibility for this is due to the inadequate medical care given the whole person with neglect of personality and environmental problems. There are also patients who fail to adjust following discharge, or who have relapses shortly after discharge. The need for improved occupational and educational therapy with better social work and psychiatric consultation could go far in averting many of these mental problems. The emotional reaction to the diagnosis of cancer and other fatal diseases and the follow-up after treatment can be very severe. This is a subject upon which very little has been written, and much work is needed as many of these patients may live for years, and efforts should be made to keep them as productive and free of emotional symptoms as possible, not only for their own sake but for those that must live with them. Certain problems that come up and must be dealt with are feelings of having never fulfilled oneself, guilt feelings towards intimates and the fear of losing control over oneself.[60]

During the past decade there have been mutual efforts on the part of organized religion and other groups concerned with mental health for a reapproachment. It would appear self-evident that the concern of the church is for the mental health of its members, and its influence is not merely restricted to church members but through its affiliated institutions, educational and medical, the opportunities for promoting mental health are widespread. The church may provide an outlet for creativeness, and many of its activities may do much to help the aged adjust. Through the expanded role of the clergyman as a counselor, he is performing a psychotherapeutic function besides selecting those individuals who should get medical help. The church also offers consolation in case of death, sickness, disaster and atonement for those guilty of transgressions. These are the potentialities of the church for preventing mental illness and needless to say, like all the other activities previously mentioned, the success depends on the individuals involved and how they use these instrumentalities. Religion does have theoretical differences from the scientific approach by maintaining some factor of unassailability, a feature that depends upon belief and faith in the possibility that physical laws can be temporarily revoked by supernatural intervention. But there is a similarity in the ideals and goals of religion and the mental health sciences even though the ideologies may superficially seem to clash, and insofar as the final goal is to permit an individual to realize himself in the most productive relationships with others, there should be no conflict.[61]

There still remains a group of very controversial measures in respect to the prevention of mental illness that should be mentioned. The first is the belief that much mental illness is due to the expectation the individual has for the future and not just his past experiences, and programs of social, economic and political reform to promote the overall mental health in a community are primary to any comprehensive advancement. Those who champion this position say that stress should be laid on preventing many disastrous family crises, such as unemployment, inducting the head of a family into military service, et cetera. It is believed that a satisfactory social adjustment is not possible under demoralizing circumstances from which a resolution is not foreseen. Various types of social legislation have been enacted whose underlying assumption must be that the prevention of much mental illness can be done via modifications of existing laws. Thus, unemployment compensation ("the sense of security following the loss of a job"), old-age and survivors insurance ("security from loss of income from old age, disability and death"), maternal and child health and welfare services (the Children's Bureau that administers grants to states to promote the health and welfare of children), vocational rehabilitation (to restore the ability of not only physically handicapped but patients with emotional disturbances and dischargees from mental hospitals), and the public health service with its wide public service

functions and since the National Mental Health Act of 1946 the National Institutes of Mental Health for research and community services.[62] The broad social implications of these measures will not be discussed here except to say that such approaches have not been tested epidemiologically but are a part of the social climate of our century that believes in and wants such activities. A second proposal sometimes heard is for eugenic sterilization of the mentally ill, and again the evidence to justify such a procedure is lacking. Although there is much evidence suggesting a hereditary nature for mental illness, the exact relations are not yet determined, and such a program would eliminate many gifted individuals besides depriving them of personal liberty. A third measure is preventive analysis, the use of psychoanalysis for individuals not yet ill but who are thought to have a high chance of becoming ill. Besides the arguments given previously against the effectiveness of analysis as a general measure, it is not now capable to predict with a high level of accuracy who will become ill, or what would happen without analysis. Although on an individual level, this program might be very useful. If our level of predictability increased, some type of preventive psychotherapy would undoubtedly be beneficial. The selection of key groups and ages presented here is not exhaustive, but it is believed this covers the major areas under consideration at the present time and that any exclusion of these groups in a program will leave a serious deficit.

V

After this review of mental health problems, the myriad numbers of people on whom the success of a program depends is seen—parents, families, teachers, religious leaders, recreational workers, physicians and nurses, all of the professions, and those who direct governmental and industrial organizations. From this ubiquitousness, the widespread concern about social health has developed, for the above groups include all problems of "social health" from intra-familial difficulties to labor-management disputes to international crises. Despite whatever psychological "dogma" one may adhere to, mental illness encompasses social and environmental forces, as well as organic and intrapsychic disturbances. Many now hold that we must have a change in our basic social philosophy to meet the mental health problems in our modern complex world. It is believed that while applied science has brought about wide changes in our mode of living, large numbers of people are guided by the same standards and attitudes that provided security in an earlier age but are no longer effective to deal with the complex problems of today. Anthropological and psychiatric research has shaken one of the long entrenched beliefs that our social ills come solely from individual conduct that must be corrected and punished, so that the supposed underlying social forces can operate without hindrance and thereby solve our problems; the social forces and laws are found to be merely specific historic creations of people and not inherent, immutable powers in group life. There is the possibility of reconstructing our culture and creating a more satisfactory emotional climate in which age-old frustrations and deprivations may be mitigated if not eliminated.[63] To accomplish this requires strong democratic leaders who see the effects that behavior in one part of society has on the other, and who have an understanding of individuals and groups. Such leaders, in government, industry, the professions, in religion and in education must be dissatisfied enough with current progress being made in preventing behavior disorders that they are willing to spend much of their time and effort in promoting research for new knowledge about behavior, furthering public health programs that we now have to successfully combat mental illness, and maintaining their devotion to hold to their course while a healthier society is slowly constructed. It is no longer possible to evade responsibility for the prevention of mental illness as "no known man or body of men now has the power to arrest the flow or alter the general direction of events, even if, on mental health grounds, that should be indicated. If we, the mental hygienists, should amputate our writing arms and seal our reluctant lips, the field would fall to the quack and charlatan, and the principal difference would be that the self-consciousness would be worse founded and more misleading. There is no choice open in that direction for us, any more than there is a way of abdication for the physicists in the face of the atomic bomb and its more violent variants."[64]

If one may go beyond the objectives of the present in merely trying to "hold the line" and just prevent the occurrence of mental illness, there may come a time when psychiatric and public health efforts will be directed toward having an individual achieve the peak effectiveness to which he is capable. It will be a cause for concern not only to

deal with one's deviations but also with one's assets, and we will worry about all those who fail to live up to their capacities, who have healthy bodies but do not use them to their own satisfaction, who are admirably equipped for physiological survival but who do not achieve psychological vitality. These are the 70,000,000 or more Americans who may not be living up to their best psychological stuff with much ineffective worry and anxiety and not handling their vocational, marital or child-raising problems.[65] If this paper could be concluded with some generalizations, it could be said that a successful solution to present and future mental health problems will draw from natural science and related social sciences, from anthropology and from organized religion. It will embody a program that gives purpose and meaning to each man's life, allays his fears and distrust, and induces and maintains such mutual confidence, co-operation and support as are needed for living together in families, groups, societies and nations.[66]

References

1. Pruyser, P. W.: Is mental health possible? Bull. Menninger Clin., 22:58, 1958.
2. Jahoda, M.: Current Concepts of Positive Mental Health. p. 1-136. New York: Basic Books, Inc., 1958.
3. Hargreaves, G. R.: Psychiatry and the Public Health. p. 1-118. London: Oxford University Press, 1958.
4. Meyer, A.: The Mental Hygiene Movement. In The Commonsense Psychiatry of Dr. Adolf Meyer. Ed. by Alfred Lief. p. 312-319. New York: McGraw-Hill, 1948.
5. Jahoda: *Op. cit.*
6. Barton, W. E.: Viewpoint of a Clinician. In Current Concepts of Positive Mental Health by Marie Jahoda. New York: Basic Books, 1958.
7. Menninger, K. A.: The Human Mind. 3rd ed., p. 1-517. New York: A. A. Knopf, 1951.
8. Jones, E.: The concept of a normal mind. Internat. J. Psycho-Analysis, 23:1, 1942.
9. Allport, G. W.: Becoming. p. 1-106. New Haven: Yale University Press, 1955.
10. Murphy, Gardner: Self-realization and mental health. Bull. Menninger Clin., 23:81, 1959.
11. Jones: *Op. cit.*
12. Fairbairn, W. R. D.: Freud, the psychoanalytical method and mental health. The Brit. J. M. Psychol., 3:53, 1957.
13. Hartmann, H.: Psychoanalysis and the concept of health. Internat. J. Psycho-Analysis, 20:308, 1939.
14. Kubie, L. S.: The fundamental nature of the distinction between normality and neurosis. Psychoanalt. Quart., 23:167, 1954.
15. Hacker, F. J.: The concept of normality and its practical significance. Am. J. Orthopsychiat., 15:47, 1945.
16. May, R., Angel E., and Ellenberger, H. F.: Eds., Existence, A New Dimension in Psychiatry and Psychology. p. 1-445. New York: Basic Books, Inc., 1958.
17. Smith, M. B.: Optima of mental health. Psychiatry, 13:503, 1950.
18. Hoch, P. H.: The etiology and epidemiology of schizophrenia. Am. J. Pub. Health, 47:1071, 1957.
19. Payne, R. W.: Diagnostic and personality testing in clinical psychology. Am. J. Psychiat., 115:25, 1958.
20. Hock: *Op. cit.*
21. Gruenberg, E. M.: Application of control methods to mental illness. Am. J. Pub. Health, 47:944, 1957.
22. Stevenson, G. S.: Prophylactic electroshock—A five year study. Am. J. Psychiat., 107:734, 1951.
23. Carstairs, G. M.: Preventive psychiatry—Is there such a thing? J. Ment. Sc., 104:63, 1958.
24. Gruenberg, E. M.: Epidemiological problems and sociological patterns. Am. J. Orthopsychiat., 27:238, 1957.
25. Lemkau, P. V.: Mental Hygiene in Public Health, Second ed., pp. 22-24. New York: McGraw-Hill Book Co., 1955.
26. Rogers, L. S.: Comparison of three methods of handling mental hygiene statistics. J. Clin. Psych., 14:251, 1958.
27. The Federal Budget in Brief for the Fiscal Year 1960. Bureau of the Budget, U. S. Government Printing Office, Washington, D. C., pp. 1-58, 1959.
28. Ruesch, J.: The trouble with psychiatric research. A.M.A. Arch. Neuro. Psychiat., 77:93, 1957.
29. Jahoda, M.: Toward a social psychology of mental health. In Mental Health and Mental Disorder. Ed. by A. M. Rose. pp. 566-577. New York: W. W. Norton & Co., 1955.
30. Rees, J. R.: The way ahead. Am. J. Psychiat., 115:481, 1958.
31. Information for Applicants, Rules and Regulations. The Am. Board of Psychiatry and Neurology, Inc., Rochester, Minnesota, 1953.
32. Ginsburg, S.: The Mental Health Movement: Its Theoretical Assumptions. In Community Programs for Mental Health. Ed. by R. Kotinsky and J. Witmer. pp. 1-29. Cambridge: Harvard University Press, 1955.
33. Blain, D., Robinson, R.: Personnel shortages in psychiatric services. New York State J. Med., 57: 255, 1957.
34. *Ibid.*, p. 256.
35. Lemkau, P. V.: Mental hygiene in public health. *Op. cit.*, p. 44.
36. Henderson, A. L.: Activities of a Mental Health Nurse. Pub. Health Rep., 65:331, 1950.
37. Editorial: Shotgun wedding. Psychiat. Quart., 24: 391, 1950.
38. Lemkau, P. V.: *Op. cit.*
39. Whitehorn, J. C.: Psychiatric Education and Progress. 1st ed. pp. 1-45. Springfield, Illinois: Charles C Thomas Co., 1957.
40. Zilboorg, G.: The mental health aspect of the communication of ideas. In Moulton, F. R., and Komora, P., (eds.): Mental Health. Lancaster, Pa.: The Science Press, 1939.
41. Carstairs, G. M., and Wing, J. K.: Attitudes of the general public to mental illness. Brit. M. J., 5096: 594, 1958.
42. Nunnally, J. C., and Borren, H. M.: Variables governing the willingness to receive communications on mental health. J. Personality, 27:38, 1959.
43. Rogers, M., Lilienfeld, A. M., and Pasmanick, B.: Prenatal and paranatal factors in the development of childhood behavior disorders. Acta Psych. et Neuroscandinav., Suppl., 102, 1955.

(Additional References are on Page 361)

Lateral Ventral or Spiegel's Hernia

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GENERALLY speaking, external anterior abdominal wall hernias are commonplace and offer no great problem in diagnosis and differentation. Inguinal, umbilical, femoral and incisional defects constitute over 98 per cent of all anterior abdominal wall hernias, the first three types occurring through natural apertures provided for the emergence of important blood vessels and other structures, such as the spermatic cord and the round ligaments of the uterus.

By far less readily explained and diagnosed, lateral ventral or Spigelian hernia is rare. Infrequently considered in the differential diagnosis of abdominal pain, these unusual defects may simulate a variety of pathologic conditions.

These hernias may occur anywhere along the linea semilunaris (Spiegel's line) which extends from the ninth costal cartilage to the pubic spine. This line lies along the outer border of the rectus abdominis muscle and corresponds to the aponeurosis of the internal oblique, between its division to form the rectus sheath medially and the termination of the muscle laterally.[1] The hernias are most frequently seen near the linea semicircularis (the so-called fold of Douglas). Those hernias occurring below the inferior epigastric artery are generally not considered to be Spigelian in type.

Various theories have been put forth to explain the cause of these defects. Several structural characteristics of the anterior abdominal wall are thought to contribute to the development of these hernias. Bailey[2] found that the muscular portions of the internal oblique and transversus abdominis consist of separate musculo-aponeurotic bands, rather than strata of evenly divided fascicles. In 10 per cent of abdominal walls, Bailey demonstrated that the defects between these bands were superimposed and were common near the linea semicircularis. Mersheimer et al[3] emphasized the fact that the fibers of the aponeurosis of the internal oblique and the transversus abdominis traverse at definite angles to each other above the umbilicus but are nearly parallel below it. Defects in the transversus abdominis along the lateral margin of the rectus muscle have been observed. These defects are thought to be relative to the lateral perforating branches of their inferior epigastric artery. Moschowitz[9] accepts Cloquet's lipoma theory as the best explanation for the development of lateral ventral hernias. The outgrowth, or protrusion, of a properitoneal lipoma through the fascial hiatus alongside a small vessel may later drag a funnel of peritoneum after it forming a true hernial sac. Since man's posture is erect, the pelvis tilts forward subjecting the lower abdominal wall to abnormal strains and pressures.

In its development, such a hernial sac penetrates the transversalis fascia, the transversus abdominis muscle and the internal oblique aponeurosis. Thus the hernia remains deep to the external oblique aponeurosis and may dissect beneath it. The sac contents are usually omentum, small intestine or large intestine, but the appendix and ovary have been found in it.

Predisposing factors in the development of these hernias include obesity, chronic cough, severe or repeated muscular effort and pregnancy. Several cases have been associated with varicose veins and other hernias.

Clinically the patient usually presents complaining of a mass, abdominal pain, or both. Often the pain is localized to the hernia site but may be of varied quality and related to body position. Occasionally these patients have presented with symp-

toms simulating acute appendicitis.[5,6] Small bowel obstruction has also been observed.[7]

On physical examination, the mass is often not readily demonstrated, presumably due to its position deep to the external oblique aponeurosis. One is more likely to make the diagnosis by examining the patient in the standing position, or by having the patient strain to sit up. At times a cough impulse or even the fascial defect may be palpable. If the latter findings are not present, it may be difficult to distinguish the mass from a tumor of the abdominal wall,[3,4] or from an intra-abdominal tumor.

Treatment of these rare hernias is surgical and consists of approaching the mass directly and separating, or incising, the external oblique aponeurosis. The hernial sac is then freed from its surrounding structures, a high ligation is done and the redundant portion of the sac is excised. Careful closure is then accomplished by layer approximation of the transversus abdominis or transversalis fascia, internal oblique, external oblique and skin.

Case Reports

Case 1.—This was a thirty-six-year-old white female, admitted to St. Mary's Hospital on August 20, 1959, complaining of a left lower quadrant mass of five years' duration. The mass had been gradually enlarging but was always reducible by the patient. This patient also complained of a dull ache in the area of the mass. This pain was aggravated by walking and was relieved by lying down. The patient denied any gastrointestinal or genitourinary complaints.

Past history revealed that the patient had a right inguinal hernia repaired about five years previously. The patient also had varicose veins of the lower extremities of twelve years' duration.

Physical examination revealed an obese, white female. General physical findings were within normal limits, except for varicosities of the lower extremities and the presence of a soft, non-tender mass, about 6 x 8 centimeters, palpable in the upper left inguinal area. This mass lay medial to the midpoint area between the anterior-superior spine and the umbilicus, was easily reducible, and was thought preoperatively to be an inguinal hernia, even though it was noted to be somewhat high.

At surgery an incision was made directly over the mass. The hernial sac was confined beneath the external oblique aponeurosis, and contained omentum. The hernial defect was at the linea semicircularis. Because of its size, it was necessary to imbricate the internal oblique aponeurosis with the underlying transversalis fascia to close the defect after ligation of the sac. The external oblique, subcutaneous tissue and skin were then approximated.

The patient was discharged on the sixth postoperative day after an uneventful recovery.

Case 2.—The second patient was a fifty-three-year-old white female first seen in St. Mary's Hospital on February 9, 1950, complaining of a mass in the right lower quadrant of seven years' duration. The patient described this mass as being about the size of a golf ball but although she had seen several physicians, the mass had not previously been found on physical examination. The mass was described as more prominent on standing. The patient admitted also a sharp pain in the area of the mass. This was at first constant. Later it became intermittent and disappeared with reclining.

The patient had also complained of a pulling sensation in the right upper quadrant not specifically related to food intake. There were no other gastrointestinal complaints. The patient admitted increased frequency of urination, nocturia one to three times a night, and occasional burning on urination during the past two years.

Physical examination revealed an obese patient. The abdomen was soft and non-tender. A small umbilical hernia was noted. In the right lower quadrant, a soft non-tender poorly defined mass was found; this was estimated to be about 4 x 6 centimeters in size.

The various diagnoses at that time were: Right kidney cyst; lipoma of the abdominal wall, or a tumor of the cecum. An intravenous pyelogram was normal. A barium enema demonstrated the cecum displaced upward apparently due to extra-colonic pressure. It was thought that the mass was extra-pelvic. The patient was discharged from the hospital and returned on March 2, 1950, for an exploratory operation.

On this second admission, the mass was noted to be somewhat tender and was more apparent on standing. The possibility of this being an abdominal wall hernia was suggested at this time.

At surgery, a right paramedian incision was made and the abdomen was explored. The abdomen was found to be intact except for the presence of a 3½ x 4 centimeter hernial defect in the right antero-lateral abdominal wall. A second incision was made directly over this defect. It was noted that the hernia had remained deep to the external oblique aponeurosis. The sac, which contained omentum, was ligated and excised. Repair was accomplished by layer closure of the transversalis fascia, internal oblique, external oblique, subcutaneous tissue and skin.

The patient was discharged after an uneventful recovery.

Summary

The etiology and clinical diagnosis of Spigelian hernia are briefly discussed. Two new cases are reported. It is suggested that patients with complaints including abdominal pain and the presence of a mass, especially along or near the linea semilunaris, always should have included in the physical examination palpation of the abdomen in the standing position. Only in this manner will many of these rare hernias be identified.

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Herpes Zoster Treated with Prednisolone

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MANY UNFAVORABLE reactions have recently been reported in patients with herpes zoster and chickenpox who were receiving Cortisone.[1] Weller, employing complement-fixation and neutralization procedures, has observed no significant antigenic differences between the agents isolated from the two diseases.[2]

The subject of this case report is a child who was treated with Prednisolone for herpes zoster and eczema.

Case Report

A.G., aged seven years, has had severe atopic eczema since she was four. Scratch tests showed multiple sensitivities to foods, pollens and epidermals. She had been treated with all the usual topical medications recommended for this disease, including coal tar, oxyquinolone and hydrocortisone ointments. She had also been hyposensitized at weekly intervals, using pollens and epidermals to which her skin reacts. In spite of almost daily examinations, it was finally necessary to give one tablet containing 5.0 mgms. of prednisolone and 10 mgms. of hydroxyzine hydrochloride (Ataraxoid) three times daily at least four days a week to control her eczema.

On August 27, 1959 she was admitted to the St. Alexius Hospital because of an exacerbation of her eczema, complicated by multiple pustules. Cultures from the skin and anterior nose disclosed streptococcus viridans. Blood and urine studies revealed essentially normal values. Her temperature was normal. An aluminum acetate solution (1:40) was applied to the skin and she was given one Ataraxoid tablet and 200 mg. of erythromycin every six hours. She was discharged from the hospital on September 8 with fairly normal appearing skin except for the chronic lichenified lesions which are always present in her popliteal and cubital areas. The evening of her discharge a few red spots appeared on her right upper chest. She returned to my office on September 10 with an acutely weeping eczema and herpes zoster involving the anterior right chest wall, at the level of the fourth and fifth thoracic dermatomes. The zoster consisted of a cluster of vesiculobullous lesions and erythematous papules. There was no evidence that herpes generalisatus had occurred.[3] Her Ataraxoid tablets were again given every six hours and the skin was kept clean but no topical medications were applied. The herpetic lesions did not spread and were dry on the 12th. She was discharged on September 14. She was next seen on the 17th, when the eczema was well controlled and no evidence of the zoster could be seen.

Summary

A child with severe eczema and herpes zoster was treated with prednisolone, and no alarming complications appeared.

When herpes zoster is complicated by an illness which requires cortisone, it is felt that under well controlled conditions, no serious contraindication exists to its use.

References

1. Editorial: Cortisone and herpes zoster. New England J. Med., 261:517, 1959.
2. Weller, T. H.: Developments in our knowledge of the acute viral exanthemas. Mod. Med. Ann., Part 2, Page 62, 1959.
3. Winkelmann, R. K., and Perry, H. O.: Herpes zoster in children. J.A.M.A., 171:876, 1959.

SPIEGEL'S HERNIA

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References

1. Morris, H. (J. Parsons Schaeffer, Ed.): Human Anatomy. New York (Toronto): The Blakiston Company, p. 517, 1953.
2. Bailey, David: Report of five cases and review of the literature. Brit. J. Surg., 19:502, 1957.
3. Mersheimer, W. L., Winfield, J. M., Ruggiero, W. F.: Spontaneous lateral ventral hernia (so-called Spigelian hernia). Arch. Surg., 63:39, 1951.
4. Isaacson, N. H.: Spigelian hernia—report of four cases. Med. Ann. District of Columbia, 25:23, 1956.
5. Watson, D., and Scotter, B.: Strangulated Spigelian hernia. Brit. Med. J., 1:74, 1951.
6. Reid, D. R. K.: Spigelian hernia simulating acute appendicitis. Brit. J. Surg., 36:433, 1949.
7. Pepper, H., Geraci, C. L.: Spigelian hernia. Arch. Surg., 75:156, 1957.
8. Koontz, A. R.: Hernia in the linea semilunaris. Annals Surg., 135:875, 1952.
9. Erdman, S.: Christopher, F., Ed.: Text Book of Surgery, ed. 4, by American authors. Philadelphia: W. B. Saunders, p. 1184, 1946.

Editorials

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CHRONIC LOCALIZED BRUCELLOSIS WITH RECURRENT CONSTITUTIONAL MANIFESTATIONS

Localized brucellosis refers to that variant of the disease wherein one can culture brucellar organisms from various tissues of the victim, such as the lung, spleen, and bone. In cases of this kind, the process often is relatively asymptomatic; detection of a localized lesion of the lung on a routine roentgenogram is a typical happening. Preoperatively the surgeon may be unaware of the nature of the lesion; hence his securing material is of extreme importance diagnostically. Rarely, localized brucellosis produces recurrent systemic manifestations for years prior to isolation of the organism from tissues. This unusual type of the disease may generate considerable confusion before definitive diagnosis is achieved, and it warrants consideration in cases of recurrent fever.

Sites of chronic localized brucellar infection associated with recurrent constitutional manifestations have been reported as including the gallbladder, liver, spleen, bone, lymph nodes, and an ovarian cyst. At the Mayo Clinic, the most common locus responsible for this syndrome has been the spleen. The symptomatic episodes usually occur yearly or more often, and ten years or more may pass before the process is identified. The episodes typically begin with a definite chill and continue with fever (oral temperature of 102° to 104° F.), sweats, malaise, myalgia, and headache, lasting two to seven days. Anorexia, nausea, and vomiting may be present; and abdominal pain, which may be related to splenomegaly, has occurred. Other symptoms and signs may be present, depending on the locus. In the experience at the Mayo Clinic, Brucella suis has been the organism most frequently responsible.

In contrast to serums from patients with bacteremic brucellosis, wherein agglutination titers exceeding 1:200 at some time during the illness are expected, in serums from patients with localized infection the agglutinins may be absent or appear only in low titer. Therefore, since cultures of the blood and serologic tests in this type of the disease may not be helpful, one's clinical suspicion of it must be correspondingly heightened if the diagnosis is to be made.

When the locus is in the spleen, thrombocytopenia and leukopenia apparently due to hypersplenism may alert one to the syndrome. Also, the clinical finding of splenomegaly may be corroborated roentgenographically by evidence of splenic calcification and of displacement of the gastrointestinal tract on barium-contrast studies.

It appears that antibiotic therapy alone is not capable of subduing chronic localized brucellar infections when the locus is in the spleen. Splenectomy definitely eliminates the splenic locus, provides cultural proof of the suspected disease, removes any hypersplenic effect on the marrow, and allows detection of additional brucellar lesions, such as retroperitoneal abscess, which have occurred in such cases.

A persistent question is whether antibiotic therapy should be given after surgical removal of the nidus. At the Mayo Clinic such therapy usually is recommended. There is mild controversy regarding the addition of streptomycin to tetracycline in treating brucellar infections; experience at the Mayo Clinic indicates such combined therapy to be more effective.

William J. Martin, M.D.

INDUSTRIAL HEALTH AND AIR POLLUTION IN MINNESOTA

One and one-half million people make up Minnesota's labor force. These are the people who are the family bread-winners, the people whose continued employment supports the economy of the state and the people who pay income taxes. Making jobs available for these people and keeping them on the job requires the dedicated effort of many groups and agencies.

"Industrial Health" programs place their emphasis on measuring, evaluating and controlling those environmental factors which may adversely affect the health of people in their places of employment. Volumes of information are available on the diagnostic establishment of the existence of

such traditional occupational diseases as silicosis, lead poisoning and benzol poisoning; on the conditions under which such diseases will occur; and on the engineering know-how for their control. Although the incidence and severity of these illnesses have been reduced, they are still with us.

Increased productivity is vital to our expanding economy. New materials, new methods, and new machines, while making this possible, eliminate some of the traditional hazards to health and improve working conditions, but simultaneously they may increase existing hazards and add a great many more to the working environment. Answers are presently being sought on the measurement of noise in industry and its effect on hearing, on the hazards of using radioisotopes, on new procedures like shielded-arc welding and on new materials such as high energy fuels or pesticide combinations.

The biggest problem facing industrial health workers today is not the establishment of the hazardous nature of a new material nor the evaluation of its use in a work situation nor the determination of means for its control, but getting recognition of the hazardous nature of materials or operations and getting adoption of good engineering control practices. Much of large industry with hazardous conditions has recognized the importance of employing staff members with industrial health training. Most people, however, work in establishments too small to employ professional health personnel. It is in these small firms that the greatest need for technical know-how exists.

Air pollution and industrial health problems are similar only in that air and its contamination are involved in each case. It can be expected that at some stage in industrial growth and population concentration problems of air pollution will occur in a community. This may be evidenced by smoke palls, reduced visibility, property deterioration, eye irritation, respiratory difficulties, or even increased morbidity and mortality rates.

An air pollution problem may exist in a community because a single source disperses an odor or black smoke or an irritating gas in a downwind direction so that there is a simple cause and effect relationship. A burning dump may be an obvious source of air pollution which needs community action for control. The elimination of such a source and perhaps several other major sources of air pollution may not greatly improve the overall problem. The general public collectively, traffic and industry may each be making a major, and, perhaps, equal contribution to the level of air pollution in a community.

In Minnesota we have been complacent about air pollution as a problem. We have been blessed with wide-open areas, with favorable topography, with fast moving meteorologic conditions, with high-grade fuel use and with absence of concentrated heavy industry. There is evidence, however, that continued complacency may not be justified.

Industrial health and air pollution programs both concern themselves with measurement, evaluation and control of air contamination. Engineering know-how is available for the solution of most industrial health problems but much basic information on environmental factors is needed before satisfactory solutions can be found for our air pollution problems. The air we breathe may well be one of Minnesota's most valuable resources. It is not too soon to be considering the need for air conservation measures.

F. L. Woodward

DRUGS IN THE TREATMENT OF OBESITY

Drugs and hormones have been given an endless trial in the treatment of obesity. Let us dispense with the use of hormones by saying that I have never read a report of a "double-blind control" study in which any hormone has helped. This statement includes the use of thyroid in any form, since extremely few obese persons are deficient in thyroid and since patients with true myxedema usually are not obese; the loss of weight in such patients is largely accounted for by water loss. No good evidence exists for the use of any other hormone from any other gland, such as the pituitary, pancreas, adrenals or gonads.

The use of some dangerous drugs has been eliminated. As an example, no one now prescribes alpha-dinitrophenol, which did produce weight loss but which also caused cataracts and sometimes death.

We are left, therefore, with a large number of drugs to depress the appetite. Millions of tablets and capsules of drugs of the amphetamine group have been prescribed, but only rarely have these drugs been submitted to double-blind control studies. However, the company producing phenmetrazine hydrochloride (preludin) has encouraged such studies, and the patients taking this

drug have done better than the controls. I have no doubt but that these medicaments do decrease the appetite, but only for a short period. To my knowledge, no one has published the results of a study employing double-blind controls at the end of one year, and I believe a safe prediction would be that no difference would be apparent after such a period. There would be no difference because the patients would not be different, and the same patients who turn to food for the relief of tension would be fat again. A few, whether receiving a drug or a placebo, would have reduced to a normal weight because they had solved the problems causing their increased appetite.

I am referring, of course, to ethical drugs prescribed by ethical physicians. The money spent by the public for weight-reduction drugs has stimulated the Committee on Government Operations to publish a report (August, 1958, #29394) entitled, "False and Misleading Advertising (Weight Reducing Remedies)." The Committee estimates that the public spends $100,000,000 annually on such products, and the Food and Drug Administration, the Post Office Department and the Federal Trade Commission are making a co-operative effort to protect the public "from being bilked through fraudulent advertising." They specifically mention Regimen (Drug Research Corporation), R.D.X. (Pharmaceuticals, Inc.), Ayds (Carlay Division, Campana Corp.) and Slim Mint (Thompson Medical Co., Inc.).

In addition to the worthless drugs that are advertised indiscriminately, the public also is enticed by a long list of amazing mechanical measures for weight reduction, such as vibrating machines and oscillating couches, used either in health salons or in the home, none of which are worth a tinker's dam.

Sooner rather than later, patients should be persuaded by their physicians to recognize that obesity is a symptom of a disturbance of "life" rather than anything physical. The patient should be told that just as there are a few patients who turn away from food (and acquire anorexia nervosa), there are millions who turn toward food. I am sure that more obese patients could be helped with good psychotherapy than with simple dietotherapy, but this is not a very helpful statement if it implies that all fat people should see psychiatrists; there are too many of the former for too few of the latter. This means that Dr. John Doe must be the first line of defense in the hope that he can prevent the need for formal psychotherapy. With "amateur" help from interested general practitioners, many patients can approach the problem honestly and, at the end of months or a year, be on the way to a solution. Some patients need "professional" psychotherapy; this aspect of obesity is thoroughly reviewed by Bruch.[1]

During this time, the question remains as to whether the physician should prescribe anorexigenic drugs. I sometimes do, but I always say, "This drug is not the answer to your problem, but it does help some people for a few weeks or months." Most of the time, I prefer to ask my patients to join with me in trying to get at the cause rather than at the symptom.

Reference

1. Bruch, Hilde: The Importance of Overweight. Ed. 1, 438 pp. New York: W. W. Norton & Company, Inc., 1957.

Edward H. Rynearson, M.D.

GOVERNOR'S CITIZENS COUNCIL ON AGING

Minnesota has been a vanguard among the states recognizing the responsibility of government for programming to meet the needs of older citizens. As early as 1951, a legislative interim commission was appointed to study these needs and methods for meeting them. Only New York and California preceded Minnesota's program. In 1957, thirty-seven states took similar action. By 1956, the reports of interim commissions indicated our state ranked among the top ten in percent of the total population who were over sixty-five years of age. Other findings pointed to the lack of opportunities for independence, self-reliance and meaningfulness to life for persons in this age group. Our social progress was not keeping abreast of medical progress.

The study of earlier commissions clearly indicated that not all of the problems could be or should be resolved by government. An advisory body was appointed by Governor Freeman to seek means for developing more meaningful roles and opportunities in later life. This group, the Governor's Citizens Council on Aging, is composed of twenty-six representatives of organizations throughout Minnesota that have a direct interest in the field of aging. Mrs. Althea Atwater, a retired social worker and former member of the School of Social Work staff, is chairman. Recently appointed

members of the medical profession are Dr. Leo A. Nash of St. Paul, chairman of the State Medical Association Committee on Aging, and Dr. Albert J. Greenberg of Minneapolis.

The Council meets monthly to conduct hearings on health, housing, welfare, employment, education, and leisure time programs. From these discussions and fact finding, they make recommendations to the legislature and various state departments for the improvement of services and opportunities. In addition, the Council sponsored three major action projects during 1958: A Centennial Pioneers Certificate to 2,500 citizens ninety years of age and older; a series of stories for local papers throughout the state called Senior Salutes depicting the satisfactory adjustments made by local citizens; and a Governor's Conference on Aging which drew 940 participants and was hailed as one of the best state conferences on aging held in this country to date.

Culmination of the past year's activity will take place in legislative halls. A five-point program has been accepted by Governor Freeman and full support of the administration will be given to seeking passage of the following bills.

1. Removal of the maximum on Old Age Assistance grants. In Minnesota, 48,314 persons now receive aid. The amount they receive is based upon individual needs. But maintenance needs in 12 per cent of the cases exceeds the present maximum of $71 per month. In addition, the maximum does not permit employment of such services as housekeeping, homemaker, foster home care which would eliminate many placements in boarding care and nursing homes. The Department of Public Welfare has estimated that removal of the present maximum would cost Minnesota approximately $800,000 per year. More important, however, is the ability it would give welfare authorities to pay for services actually needed rather than limit them because of an arbitrary maximum.

2. The State Department of Health has only two inspectors for 626 licensed medical facilities in Minnesota. The Council feels that the standards of care cannot be raised in nursing and boarding care homes unless this staff is increased to six. This would cost $28,500 per year—a modest sum for the benefits that would be realized.

3. The boom in construction of nursing home facilities has greatly relieved the pressure felt in 1957 when the Council recommended state grant-in-aid to counties for construction or rehabilitation of nursing homes on a matching dollar basis. The 857 beds built and 1,160 under construction is misleading, however. Many areas of the state had no additions and will not have because lending institutions are hesitant to invest in these areas. Hence, the Council recommended that $1,000,000 be made available for "distressed counties on a matching basis," to stimulate new construction and assure the availability of services where they are most needed.

4. Only counties now have the authority to bond themselves for construction of nursing homes and homes for the aged. Several communities have sought special legislation to do so. It seems democratic and advisable that any village or city be so authorized, subject to approval of plans by the State Department of Health.

5. Commitment of persons diagnosed as senile is up 8 per cent since 1952 and now 40 per cent of all first commitments are over age sixty-five. It is estimated that 50 per cent to 70 per cent of all commitments are made without an evaluation of the resources, family background and other social factors being available to the court of the hospital. The Council recommends that the present law permitting probate judges to request such pre-commitment studies by the county welfare board be made mandatory. The value of such information for protection of the individual and for treatment program design is obvious.

The Council has made other recommendations for improved and increased services to older citizens. They support the Department of Welfare's program to pay 80 per cent of the administrative cost for employing a specialist in community projects such as mental health, mentally retarded, the aged, et cetera.

In 1959, plans call for development of a health committee to study means of financing medical care costs for the aged and for developing a classification index for the licensing of nursing homes. In addition, the Governor has charged the Council with the responsibility of developing plans for Minnesota's contribution to the White House Conference on Aging to be held in January 1961. Little more can be scheduled, for the Council will continue its efforts to develop local Councils on Aging

to aid in the tremendous responsibility of identifying who our aged are, what are their needs, and how can they be met. Society is faced with a new social phenomena—an abundance of older citizens —which requires creative planning on a long range basis.

Bernard E. Nash
Governor's Citizens Council on Aging

CONSTRUCTION NEEDS OF MEDICAL SCHOOLS

In a recent survey by the Association of American Medical Colleges, seventy-eight fully developed four-year United States medical schools indicated a need for $757.2 million in construction funds between now and 1965 for the building of new teaching, research, hospital, outpatient, and administrative facilities, as well as for the remodeling and renovation of existing plants.

Exclusive of student dormitories, recreational areas, and other facilities not directly related to teaching programs, this estimated need for construction funds breaks down as follows: $306.3 million, hospital and orthopedic facilities; $261.2 million, educational facilities; $142.8 million, research facilities; $32.2 million, rehabilitation and remodeling facilities; and $14.7 million medical school administration facilities.

Association of American
Medical Colleges

The National Tuberculosis Association, organized in 1904, was the first voluntary organization formed by doctors and laymen to work together against a specific disease. Today it has constituent associations in every state and territory. Affiliated with these are associations organized on a county or city basis. Altogether, there are 2,700 voluntary tuberculosis associations joined in a common cause. Their registered trademark is the red double-barred cross.

* * *

Tests have shown that about a third of the United States population has been infected with tuberculosis. One out of twenty of these will probably develop the disease.

Last year alone, there were over 80,000 new cases of tuberculosis. Those were the ones that were found. Another 100,000 Americans have tuberculosis in active, infectious form and do not know it.

ACCURACY OF ROUTINE GALL-BLADDER AND BILE-DUCT STUDIES

(Continued from Page 324)

References

1. Russ, P. E., and Cavanaugh, C. J.: The gall bladder: Comparison of roentgen and pathologic findings. Southern M. J., 45:232 (March) 1952.
2. Smith, H. P., and Runge, T. M.: Oral cholecystography: Critical review of 200 operated cases. Gastro-enterology, 18:49 (May) 1951.
3. Morgan, R. H., and Stewart, H. B.: Clinical experience with telepaque, a new gall bladder compound. Radiology, 58:231 (Feb.) 1952.
4. Shehadi, W. H.: Oral cholaniography with telepaque. Am. J. Roent., 72:436 (Sept.) 1954.
5. Leving, M. H., and Crosbie, S. I.: The value of a routine abdominal film. J.A.M.A., 156:220 (Sept. 18) 1954.
6. Scanlon, R. L., and Young, B. R.: The roentgen diagnosis of gall bladder and biliary tract disease without cholecystography. Am. J. Roent., 72:639 (Oct.) 1954.
7. Kirklin, B. R.: A new position for cholecystography. Am. J. Roent., 60:263 (Aug.) 1948.
8. Walker, J. H.: Biliary tract roentgenography in lateral decubitus position. Am. J. Roent., 80:945, 1958.
9. Reynolds, L., and Fulton, H.: Oral cholecystography with iopanoic acid (telepaque). J.A.M.A., 159: 1358, 1955.
10. Brewer, A. A.: Physiological stasis: A cause of cholecystographic error. Am. J. Roent., 58:106 (July) 1947.
11. Salzman, E., Spurck, R. P., Kier, L. G., and Watkins, D. H.: Opacifying gallstones. J.A.M.A., 169: 334 (Jan. 24) 1959.
12. Salzman, E., and Warden, M. R.: Telepaque opacification of radiolucent biliary calculi: "Rim sign." Radiology, 71:85 (July) 1958.
13. Gershon-Cohen, J., Orloff, T. L., Sklaroff, D. M., and Cohn, E. M.: Intravenous cholangiography and cholecystography. Am. J. Roent., 72:801 (Nov.) 1954.
14. Johnson, H. C., Minor, B. D., Thompson, J. A., and Weens, H. S.: Diagnostic value of intravenous cholangiography during acute cholecystitis and acute pancreatitis. New England J. Med., 260:158, 1959.
15. Martin, F., and Massimiano, A. G.: The non-visualized gall bladder. New England J. Med., 246: 488 (March 27) 1952.
16. Shapiro, R.: Cholecystography. Radiology. 62:245 (Feb.) 1954.
17. Sukman, R., and Daron, P. B.: Roentgen visualization of the rokitansky-aschoff sinuses as an additional sign of chronic gall bladder disease. Radiology, 60: 714 (May) 1953.
18. McClenahan, J. L., Evans, J. A., and Braunstein, P. M.: Intravenous cholangiography in post-cholecystectomy syndrome. J.A.M.A., 159:1353, 1955.
19. Wise, R. E., Johnston, D. A., and Salzman, F. A.: Intravenous cholangiographic diagnosis of partial obstruction of common bile duct. Radiology. 68: 507, 1957.
20. Rosenblum, D., and Schwartz, S.: Intravenous cholangiography in the presence of jaundice. Radiology, 67:247 (Aug.) 1956.
21. Cattell, R. B., and Warren, K. W.: Surgery of the biliary tract. Medical progress. New England J. Med., 255:698-704, and 761-768, 1956.

President's Letter

OUR WOMAN'S AUXILIARY

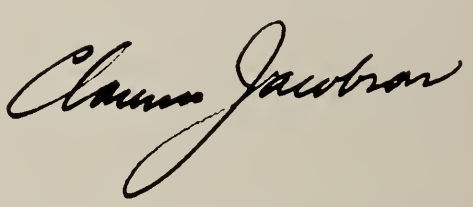
Members of the medical profession can state without contradiction that its Woman's Auxiliary continues to be its most effective ally. It is well to keep in mind that auxiliaries are not independent organizations, but parts of the American Medical Association and its constituent societies. This relationship enables the companion organization to become more intimately aware of the problems facing the medical profession.

Since its founding in 1922, the Woman's Auxiliary to the Minnesota State Medical Association has been and continues to be a dynamic group in carrying out its objectives. During the thirty-eight years of the Auxiliary, members have more than fulfilled these objectives when one surveys their activities. Auxiliary committees are working side by side with the State Medical Association, procuring funds for the American Medical Education Foundation, participation in the Civilian Defense, Community Service, Medical and Surgical Relief, Mental Health, paramedical careers and legislation, to mention a few. Many members of the nursing profession have, through encouragement and financial aid of the Auxiliary, been able to finish their training. When necessary, undesirable legislation for the public welfare is combated by letters to our legislators and congressmen from Auxiliary members.

The problem of the aging is being studied by the medical profession as a whole. We must recognize and must inform others that this is not a problem of the medical profession alone. Businessmen, community leaders, and civic groups must be educated to the point of view that sweeping national legislation is poor assurance for a high standard of medical care for these people. In this area also, we must be grateful for the efforts of Auxiliary members.

The members of the Auxiliary are well informed through their publication, the *National Bulletin,* and the Minnesota *Gopher Doctor's Wife.* The new *AMA News* has proven an effective publication for the Auxiliary as well. I know of no other auxiliary so well informed and willing to work for the ideals and objectives of the profession they represent.

Anything the State Association can contribute to our most worthy ally has been already amply repaid. Their loyalty and interest will continue to sustain us during the difficult years ahead.



President, *Minnesota State Medical Association*

Minnesota State Medical Association

107th Annual Meeting

Rochester, Minnesota — May 23-25, 1960

Guest Speakers



KENNETH B. BABCOCK, M.D.

Chicago, Illinois

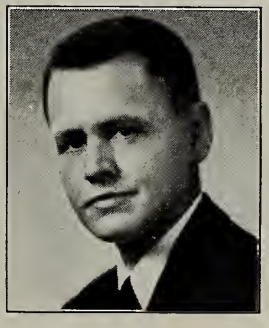
Kenneth B. Babcock, M.D., will participate in a Round Table Luncheon, Monday, May 23, at 12:15 p.m., on "Accreditation of Small Hospitals". Doctor Babcock is Director of the Joint Commission on Accreditation of Hospitals, Chicago, Illinois.

CLIFFORD J. BARBORKA, M.D.

Chicago, Illinois

"The Diagnosis of Gastrointestinal Cancer" will be the title of a presentation given by Doctor Barborka as part of the Symposium on Cancer Detection for Practicing Physicians, Tuesday, May 24 at 9:00 a.m. Doctor Barborka is Professor of Medicine, Chief of Gastrointestinal Clinics, and Director of Research in Gastroenterology, Northwestern University Medical School, Chicago, Illinois.





TAGUE C. CHISHOLM, M.D.

Minneapolis, Minnesota

Tague C. Chisholm, M.D., will present the Arthur H. Sanford Lecture in Clinical Pathology on Monday, May 23, at 11:30 a.m. Doctor Chisholm is Clinical Associate Professor of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota. He is sponsored by the Minnesota Society of Clinical Pathologists.

GEORGE C. ESCHER, M.D.

New York, New York

"Chemotherapy" will be the title of the presentation to be given by Doctor Escher in the Symposium on Cancer Treatment on Tuesday, May 24, at 2:00 p.m. Doctor Escher is a Consultant, National Cancer Institute; Associate Sloan-Kettering Institute; and Assistant Professor of Medicine, Cornell University Medical College, New York, New York. Sponsored by the Minnesota Division of the American Cancer Society.





BENJAMIN FELSON, M.D.

Cincinnati, Ohio

Benjamin Felson, M.D., Professor and Director, Department of Radiology, University of Cincinnati College of Medicine; and Director, Department of Radiology, Cincinnati General Hospital, Cincinnati, Ohio, will present "Some Fundamentals of Chest Roentgenology" in a Symposium on "Diseases of the Lung" on Monday, May 23, at 2:00 p.m. Doctor Felson will also participate in a Clinical-Pathological Conference on Diseases of the Chest at 4:00 p.m. on Monday, May 23.



LAURENCE M. GOULD, Ph.D.

Northfield, Minnesota

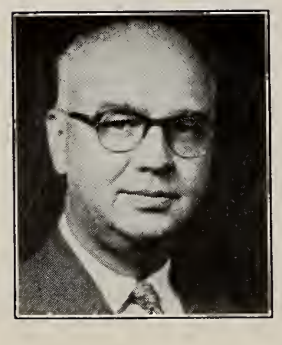
Laurence M. Gould, Ph.D., will present the address at the Annual Banquet on Tuesday, May 24, at 7:00 p.m. Doctor Gould has chosen the topic "Education for A World of Change" for his address. Doctor Gould is President of Carleton College in Northfield, Minnesota.



WILLIAM J. GROVE, M.D.

Chicago, Illinois

A Symposium on Cancer Treatment on Tuesday, May 24, at 2:00 p.m. will include a presentation "Surgical Aspects" by William J. Grove, M.D., Chicago, Illinois. Doctor Grove, who is an Associate Professor of Surgery at the University of Illinois, Chicago, will also serve as Moderator for a panel on Management of The Far-Advanced Cancer Patient at 4:00 p.m. on Tuesday, May 24.



FREDERICK J. HOFMEISTER, M.D.

Milwaukee, Wisconsin

Frederick J. Hofmeister, M.D., will head a Round Table Luncheon on "Office Gynecology—Complete Gynecological Examination" on Monday, May 23, at 12:15 p.m. Doctor Hofmeister is the Director, Department of Obstetrics and Gynecology, Milwaukee Hospital and Marquette University. His appearance is sponsored by the Minnesota Department of Health.



JOHN S. LUNDY, M.D.

Chicago, Illinois

John S. Lundy, M.D., Consultant in Anesthesiology to Veterans Administration Research Hospital, and Associate Professor Surgery (Anesthesiology), Northwestern University Medical School, Chicago, Illinois, will present "New Means for the Safe and Effective Relief of Pain" in a Symposium on Management of the Far-Advanced Cancer Patient, Tuesday, May 24, at 4:00 p.m.



WAYNE E. MATHY, M.D.

Chicago, Illinois

"Prevalence of Rheumatic Fever in Minnesota" is the title of the presentation to be given by Wayne E. Mathy, M.D., in a Symposium on Rheumatic Heart Disease on Monday, May 23, at 9:00 a.m. Doctor Mathy is a Research Fellow in Infectious Diseases, Cook County Hospital, Chicago, Illinois. He is sponsored by the Minnesota Heart Association.



WALTER T. MURPHY, M.D.

Buffalo, New York

Walter T. Murphy, M.D., Director of Therapeutic Radiology, Roswell Park Memorial Institute, Buffalo, New York, will present the Russell D. Carman Memorial Lecture, Tuesday, May 24, at 11:30 a.m. The title of the Lecture is "The Meaning of Curative and Palliative Radiation Therapy". Doctor Murphy will also present "Radiation Therapy" in a Symposium on Cancer Treatment at 2:00 p.m. Tuesday, May 24. Doctor Murphy is sponsored by the Minnesota Radiological Society.



JOSEPH H. OGURA, M.D.

St. Louis, Missouri

Joseph H. Ogura, M.D., will present the Minnesota Academy of Ophthalmology and Otolaryngology Lecture at 11:00 a.m. on Tuesday, May 24. The title of his address will be "Cancer of the Throat". Doctor Ogura, who is sponsored by the Minnesota Academy of Ophthalmology and Otolaryngology, is Professor of Otolaryngology at the Washington University School of Medicine, St. Louis, Missouri.



BEN M. PECKHAM, M.D.

Madison, Wisconsin

"Tissue Diagnosis in Uterine Cancer" will be the title of a paper presented in a Symposium on Cancer Detection for Practicing Physicians, Tuesday, May 24, at 9:00 a.m., by Ben M. Peckham, M.D. Doctor Peckham is Professor and Chairman, Department of Gynecology and Obstetrics, University of Wisconsin Medical School, and University Hospitals, Madison, Wisconsin; and is sponsored by the Northern Minnesota Medical Association.



CHARLES H. RAMMELKAMP, JR., M.D.

Cleveland, Ohio

The Minnesota Heart Association is sponsoring Charles H. Rammelkamp, Jr., M.D., Professor of Medicine and Associate Professor of Preventive Medicine, Western Reserve University School of Medicine; and Director of Medicine, Cleveland Metropolitan General Hospital, to present "Treatment of Acute Rheumatic Fever" on the Symposium on Rheumatic Heart Disease, Monday, May 23, at 9:00 a.m.



ANTHONY RUPPERSBURG, JR., M.D.

Columbus, Ohio

Anthony Ruppersburg, Jr., M.D., will give a demonstration on "Maternal and Infant Mortality As Related to Obstetrical Mechanisms" on Tuesday, May 24, between 3:15 and 4:00 p.m. He will also head a Round Table Luncheon on Tuesday, May 24, at 12:15 p.m. on "Obstetrical Emergencies". Doctor Ruppersburg is Clinical Assistant Professor, Obstetrics and Gynecology, Ohio State University College of Medicine, Columbus, Ohio. He is sponsored by the Minnesota Department of Health.



A. H. SCHWICHTENBERG, M.D.

Albuquerque, New Mexico

A. H. Schwichtenberg, M.D., Head of the Department of Aerospace Medicine, The Lovelace Foundation for Medical Education and Research in Albuquerque, New Mexico, will present a Lecture on Space Medicine at 11:00 a.m., Monday, May 23.



HOWARD S. VAN ORDSTRAND, M.D.

Cleveland, Ohio

Howard Van Ordstrand, M.D., will be a participant in a Clinical-Pathological Conference on Diseases of the Chest at 4:00 p.m., Monday, May 23, in addition to his presentation of "Emphysema" on the Symposium on Diseases of the Lung at 2:00 p.m., Monday, May 23. Doctor Van Ordstrand is Head of the Department of Pulmonary Diseases at the Cleveland Clinic Foundation, Cleveland, Ohio.

Sports Events

Sunday, May 22

General Information

Participants in sports events, their wives, and all who attend the Annual Meeting are invited to attend a Sports Events Smorgasbord at 5:00 p.m. at the Rochester Country Club on Highway 14, south side of the road, three miles west of Rochester. Tickets for the smorgasbord, $2.75, gratuity included. Entertainment for doctors' wives who do not want to play golf will be provided at the Country Club.

Golf Tournament

Place: Rochester Country Club

Tee-off Time: 10:00 a.m.-12:00 Noon — Sunday

Prizes will be awarded to the low scorers. Green fees — $5.00. Make reservations individually or with your partner, indicating preferred tee-off time.

Skeet and Trap Events

Place: Rochester Gun Club

Time: 1:00 p.m.-4:00 p.m. — Sunday

The Club is located one-fourth mile west of St. Mary's Hospital on Highway 14 behind the golf driving range on the north side of the highway. Driveway entrance is behind State Highway Department offices.

Events will include regular skeet and trap rounds of twenty-five shots in each round. Prizes will be awarded at the Sports Events Smorgasbord at the Rochester Country Club.

Minnesota State Medical Association

107th Annual Meeting

Rochester, Minnesota — May 23-25, 1960

Scientific Exhibits

Booth Number

S-16 Acute Tendon Ruptures, Recognition and Treatment
Kenath H. Sponsel, Colonial Orthopedic Center

S-25 Association of American Physicians and Surgeons

S-26 Blue Shield
Minnesota Medical Service, Inc.

S-15 Control of the Organic Hyperkinetic Behavior Syndrome in the Elementary School Child
V. Richard Zarling and Joe Hogan, Ph.D.

S-10 Education of the Juvenile Diabetic
Donnell D. Etzwiler, St. Louis Park Medical Center

S-19 Mayo Clinic and Mayo Foundation
Tumors of the Parotid Gland, Their Surgical Management
O. H. Beahrs, K. D. Devine, L. B. Woolner
Misleading Calcific Shadows in the Abdomen
L. G. Bartholomew, J. C. Cain, G. D. Davis, A. H. Bulbulian
Secretory Otitis Media in Children
C. F. Lake, R. L. J. Kennedy
Congenital Muscular Torticollis (Wryneck)
M. B. Coventry, L. E. Harris, A. J. Bianco, Jr.

S-24 Minnesota Department of Civil Defense
The Minnesota Civil Defense and Disaster Medical Care Program

S-9 Minnesota Department of Health, Division of Hospital Services
Hospitals and Nursing Homes

S-23 Minnesota Department of Health and Minnesota State Dental Association
The Askov Dental Demonstration

S-2 Minnesota Department of Public Welfare, Division of Child Welfare
Adoption Agencies in Minnesota

S-12 Minnesota Heart Association
Work Evaluation Unit

S-20 Minnesota Medical Foundation

Booth Number

S-8 Minnesota Society for Crippled Children and Adults, Inc.
Easter Seals = Service

S-11 Minnesota Society of Medical Technologists
Educated Minds and Trained Hands

S-14 Minnesota Society for Prevention of Blindness
Blindness Prevention in Minnesota

S-17 Minnesota State Medical Association (Committee on Child Health and Immunization) and Minnesota Department of Health
Accidents: Childhood's Greatest Health Hazard

S-21 Minnesota State Medical Association (Committee on Public Health Nursing)
The Public Health Nurse — A Community Resource for Good Patient Care

S-5 Minnesota State Medical Association (Heart Committee), Minnesota Heart Association, Minnesota State Pharmaceutical Association, and Minnesota Department of Health
Rheumatic Fever

S-6 Minnesota State Pharmaceutical Association

S-13 Minnesota Tuberculosis and Health Association
Minnesota Tuberculosis Story

S-1 Muscular Dystrophy Associations of America, Inc.
Help and Hope for the Dystrophic Patient

S-22 National Cystic Fibrosis Research Foundation
Cystic Fibrosis, The Most Serious Pediatric Pulmonary Problem

S-7 Olmsted County Association for Mental Health

S-18 Surgical Aspects of Thoracic Aneurysms
Joseph J. Garamella, W. R. Schmidt and N. K. Jensen

S-3 University of Minnesota Medical School, Division of Dermatology
Griseofulvin Therapy for Dermatomycoses
James L. Tuura, Duane R. Anderson and Francis W. Lynch

S-4 Veterans Administration Hospital
Oscillometric Arterial Circulatory Norms
Bror S. Troedsson

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

THE FOURTH ESTATE COMMENTS ON SOCIAL SECURITY EXPANSION

Interesting are the editorial comments of the nation's press in light of the various proposals for expansion of the Social Security system to include medical care for the aged.

Among the many editorial expressions which questions the wisdom of such legislation are the following:

Social Security Is Increasing Beyond Defense

American taxpayers are presently committed to expenditures of over $1 trillion. One-fourth of the total, or upwards of $250 billion, is marked for payment of present Social Security obligations, Ardell T. Everett, Prudential Vice President, told the National Taxpayers Conference.

"The fastest growing item in federal spending is not defense but social welfare programs, which have been increasing at a rate of over $1 billion a year since 1953," Mr. Everett declared.

Federal welfare spending will amount to more than $20 billion during the next fiscal year, he said. "For the year ending June 30, 1958, special welfare expenditures at all levels of government amounted to $44 billion, 10 per cent of the national output."

The speaker contended that although Social Security taxes are called "contributions" they are "nothing more than another part of our total tax load."

"Our system of hidden taxes on products and services and emphasis on dollar take home pay—with payment of taxes through withholding devices—misleads the public as to the true tax burden necessary to support social welfare payments." (*Eastern Underwriter,* February 19, 1960)

Why Your Paycheck Is Shrinking

Uncle Sam Now Takes Bigger Withholding Bite: If you are wondering why your paycheck doesn't seem to stretch as far today as it did a little while back, Uncle Sam has one answer for you. More of it is being withheld at source.

That is, the government is getting an increased amount of it in higher Social Security taxes.

And some of you may be finding more withheld because of rising charges for hospital and medical insurance. Some may find more withheld under company pension plans.

Those lucky enough to have received a pay raise recently will also note that a sizable chunk of the increase is withheld at source to take care of federal income taxes, and in some cases state income taxes.

Even if your take-home pay hasn't dwindled because of this, there has been a steady if slow rise in the last year in the prices of many things you buy—except for that big item, food.

In most cases there has been an even larger rise in the cost of the various services you need or demand—all the way from transportation fares to fees for personal care.

The take-home pay shrinkage shouldn't have come as a shock to you. It was widely publicized ahead of time.

But the slimmer look of the paycheck figures gives many a person a start, nevertheless.

The Department of Commerce notes that in January the total of wages and salaries advanced to an annual rate of $276.5 billion.

The gain over December was more than $2 billion. And it put this January ahead of a year ago by some $28 billion at an annual rate.

But here comes the joker. In January, the Social Security tax rate rose to three per cent from 2 1/2 per cent. The government took in some $90 million more from employes (and a similar amount from employers).

Contributions are now running at an annual rate of $9.5 billion up more than $1 billion from the December rate. The Social Security tax rate will continue to rise to provide for increased payments. Part of these payments will be in larger benefits to the eligible—although not all over sixty-five are now eligible by any means.

But more of the increase in funds will be needed simply because there will be a lot more persons of sixty-five or over in the years ahead—and an increasing percentage of them will be eligible for benefits.

There are now some 15.5 million Americans in

this age group. It is estimated that by 1970 there will be 19 million and by 1975 nearly 21 million. Their percentage of total population continues to grow. The other big increase is in the number of those under twenty.

Those in the middle span remain much more constant. And it is this working group whose taxes are going up. In time the accumulated funds will be taking care of them, too, if only meeting part of their retirement needs.

Social Security payments aren't the only income of the older population by any means.

The Department of Health, Education and Welfare estimates that their total income has gone up $6 billion since 1954 to a total of $30 billion, with Social Security providing about $9 billion of it. Gains in private pension plans, employment, savings, investments and public aid make up the rest. (*Chicago Daily News,* February 19, 1960).

Report Hits U. S. Aid To Aged

The Republican minority of the Senate subcommittee on problems of the aged has submitted a report opposing federal aid recommended for elderly persons by the Democratic majority.

Senators Dirksen (Ill.) and Barry Goldwater (Ariz.) said there was no need for the federal government to interfere.

Warn on Taxation

"The children and middle-aged adults of today are just as ready to discharge their filial responsibilities as were those who preceded them," their minority report said.

"Our task is to give them the opportunity to do so without destroying their own standards of living by excessive taxation which must accompany unnecessary and ever larger government expenditures."

They opposed recommendations that the federal government finance health benefits for persons receiving old age and survivors' disability benefits. That plan makes no provision for the most needy of all, persons on public assistance rolls, the two senators said.

Charge Unfair Tax Load

The proposal to raise social security benefits would put an unfair tax burden on wage earners, they said, and ultimately would reduce America's power to advance living standards for everyone.

The Dirksen-Goldwater report objected to suggestions for new federal agencies to "establish a paternalistic control over our older citizens." Individuals and private firms have proven their ability to handle private pension plans, annuities and insurance, the report said, and if the federal government takes over the obligation, many persons no longer will try to meet their responsibilities. (*Chicago Sunday Tribune,* February 14, 1960).

Alert Politicians

You have to hand it to the "liberal" politicians in Washington—they are certainly alert to new political possibilities. One of the newest to attract their cupidity is a rising proportion of older people in the population.

Thus a report just issued by a Senate Labor subcommittee headed by Senator McNamara urges a vast program of Federal aid to such people, to whom these politicians insist on applying the euphemism "senior citizens." There would be increased social security benefits, medical care as part of social security, public housing for the elderly, and even a Federal bond gimmick pegged to the cost of living.

Now no one questions that some older people have a hard time of it. What may very seriously be questioned is this notion that the way to help them is to make them a special group of mendicants along with farmers and healthy veterans and other categories on the handout list, and to do this for supposed political gain.

One of the chief difficulties older people have is caused by inflation. And pray what causes inflation? It is this wild Government spending, the fantastic deficits and debt with which "liberals" over the years have saddled the nation.

The way to help all the people, including old ones, is not still more reckless spending, deficit, debt and inflation. The right way is to halt this massive irresponsibility with the people's money by curbing spending and lowering taxes. And, if these politicians were only alert enough to grasp the point, that could also be the most astute politics. (Editorial, *Wall Street Journal*—February 9, 1960).

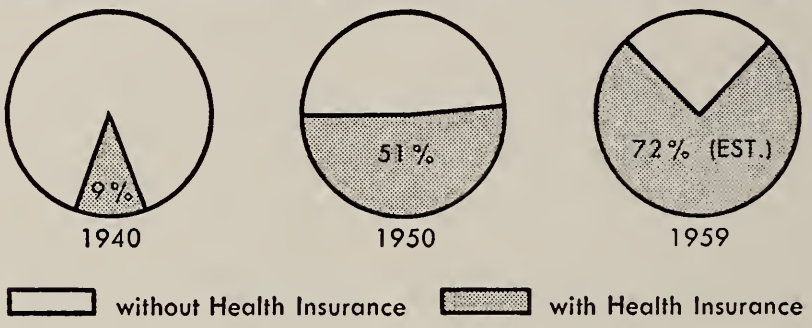
HEALTH INSURANCE PROTECTS 127 MILLION, ESTIMATED 1959 BENEFITS TOP $5 BILLION

An estimated 127 million Americans—three out of every four persons in the nation—were protected by health insurance against the cost of hospital and

doctor bills at the end of 1959. During the year, an estimated $5.1 billion in health insurance benefit payments were distributed among these insured persons by insurance companies, Blue Cross-Blue Shield, and other health care plans, according to the *Health Insurance News.*

Of the $5.1 billion in benefits, some $2.8 billion were paid out by insurance companies alone, up from $2.6 billion in 1958, the Institute declared. With the inclusion of benefits paid for accidental death and dismemberment, the insurance company total in 1959 reached $2.9 billion.

Percentage of U. S. Civilian Population with Health Insurance



Both the coverage and benefit figures were new highs. The 127 million insured persons, representing 72 per cent of the civilian population, surpassed the 1958 year-end figure of 123 million, and the $5.1 billion in benefits was an increase of 10 per cent over the 1958 sum of $4.7 billion.

The five major types of health insurance—hospital expense, surgical expense, regular medical, loss of income, and major medical—all showed an increase during 1959 in the number of persons protected, extending the consistent growth of health insurance.

In 1940, some twelve million persons, or nine per cent of the civilian population, were protected against the cost of ill health by health insurance said the Institute. In 1950, the coverage figure was nearly 77 million, or 51 per cent of the population, and in 1959 it was 127 million, or 72 per cent of the nation.

In 1959, the coverage increases were from 111 million to 119 million persons in surgical insurance, from 75 to 82 million in regular medical insurance, and from 42 to 43 million in loss-of-income.

Major Medical

The growth in coverage under major medical expense insurance, which provides benefits ranging from $5,000 to $15,000 to help pay for the cost of serious illness, was at a more rapid pace than the other types of insurance. The number of persons with major medical insurance rose 21 per cent, from 17 to 21 million.

The largest single outlay of benefit dollars by insurance companies was the more than $1.1 billion which went to defray the cost of hospital care, an increase of more than $70 million over the year before.

However, major medical expense insurance once again showed the greatest increase in benefits paid. Persons covered by major medical policies received an estimated $326 million in benefits in 1959, a 37 per cent increase over the 1958 figure of $238 million, and more than five times the 1956 total of $64 million. These major medical benefits pay for virtually all types of medical services, including medicines and drugs, medical appliances and physicians' services in addition to hospital and surgical care.

Surgical expense insurance accounted for $416 million in benefits, up from $402 in 1958, and persons with regular medical expense insurance policies received $106 million in benefits, up from $101 million.

Loss-of-income benefits rose from $850 million in 1958 to $912 million in 1959.

1959 BENEFIT PAYMENTS BY INSURANCE COMPANIES

Americans received an estimated $2.9 billion in health insurance benefits from insurance companies in 1959, an increase of nine per cent over the more than $2.6 billion paid out in 1958. A breakdown of benefits according to type of coverage for

the last two years, and the percentages of increase, follow:

Type of Coverage	*1959* (in millions	*1958* of dollars)	*Per Cent Increase*
Hospital Expense*	$1,139	$1,068	6.6%
Surgical Expense*	416	402	3.5
Regular Medical Expense	106	101	5.0
Major Medical Expense	326	238	37.0
Loss of Income†	912	850	7.3
TOTAL	$2,899	$2,659	9.0%

*Excludes benefits for hospital and surgical expenses received by major medical expense policyholders.

†Includes accidental death and dismemberment benefits.

DID YOU KNOW?

★ That before World War II, three out of every four hospital admissions involved surgery; today about three out of every five admissions involve surgery.

★ That three out of every ten persons involved in motor vehicle accidents require hospitalization.

★ That nearly one out of every seven Americans has a chronic or permanent health impairment.

★ That about six million Americans suffer from some degree of hearing loss, and visual defects of varying degree afflict three million Americans.

★ That a survey of dentists suggests that there is a higher incidence of tooth decay among women than among men.

★ That the average person in the United States sees his doctor five times a year, with most visits taking place at the physician's office; only 10 per cent of physicians' visits were to the patient's home.

STUDENT EXTERNS IN HOSPITALS NOT AFFILIATED WITH MEDICAL SCHOOLS

From a recent questionnaire of the Liaison Committee on Medical Education, information was obtained on the number of medical students throughout thirty-eight schools who were employed as externs in hospitals not affiliated with medical schools: 1.7 per cent of the sophomore students; 8.5 per cent of the junior students, and 14.2 per cent of the senior students were so employed during the 1957-58 academic year.

PREVENTIVE PSYCHIATRY— PRESENT STATUS AND FUTURE

(Continued from Page 343)

44. Eastman, N. J.: Psychiatric Aspects of Pregnancy and Childbirth. Williams' Obstetrics. 11th ed. pp. 346-364. New York: Appleton-Century Crofts, Inc., 1956.
45. Gruenberg, E.: The prevention of mental disorders. J. Chron. Dis., 9:187, 1959.
46. Bender, L.: Emerging patterns in child psychiatry. Bull. New York Acad. Med., 34:794, 1958.
47. Gruenberg, E. M.: The prevention of mental disease. Ann. Am. Acad. Polit. & Soc. Sc., 286:158, 1953.
48. Rosenau: Preventive Medicine and Public Health. 8th ed. pp. 756-801. New York: Appleton-Century Crofts, Inc., 1956.
49. Kaplan, L.: Mental Health and Human Relations in Education. 1st ed. pp. 1-476. New York: Harper Brothers, 1959.
50. The New York Times, Feb. 22, 1954.
51. Blair, G. M.: Personality adjustment of teachers as measured by the multiple choice Rorshach test. J. Educat. Res., 39:652, 1946.
52. National Educational Association, Research Division: A teacher looks at personnel administration. Res. Bull., 23:100, 1945.
53. Balser, B. H., Brown, F., Brown, M., Laski, L., and Phillips, D. K.: Further report on experimental evaluation of mental hygiene techniques in school and community. Am. J. Psychiat., 113:733, 1957.
54. Kaplan, O. J. (Editor): Mental Disorders in Later Life. 2nd ed. Menlo Park, California: Standford University Press, 1955.
55. Goldfarb, A.: Patterns in planning a psychiatric program for the aged. Bull. New York Acad. Med., 34:811, 1958.
56. *Ibid.*, p. 813.
57. Zeman, F. D.: Constructive programs for mental health of the elderly. Ment. Hyg., 35:221, 1951.
58. Ross, W. D., Kehoe, R. A., and Levine, M.: Practical Psychiatry for Industrial Physicians. 1st ed. pp. 101-115. Springfield, Illinois: Charles C Thomas Co., 1956.
59. Gordon, G.: Industrial psychiatry—Five year plant experience. Indust. Med., 21:585, 1952.
60. Rosenthal, H.: Psychotherapy for the dying. Am. J. Psychotherapy, 40:626, 1957.
61. Lowry, L. G.: Religion and psychotherapy: Practical aspects. Internal. Rec. Med. & Gen. Pract., 168:783, 1955.
62. Schottland, C. I.: The mental health implications of social legislation. Am. J. Orthopsychiat., 28:112, 1958.
63. Frank, L. K.: Society as the Patient. 1st ed. pp. 1-395. New Brunswick: Rutgers University Press, 1948.
64. Seeley, J. R.: Social values, the mental health movement and mental health. Ann. Am. Acad. Polit. & Soc. Sc., 286:15, 1953.
65. Sanford, F. H.: Creative health an the principle of habeas mentem. Am. J. Pub. Health, 46:139, 1956.
66. Woodward, L. E.: Social health—An increasing dimension in orthopsychiatry. Am. J. Orthopsychiat., 27:445, 1957.

Public Health

LOCATION OF REGIONAL POISON INFORMATION CENTERS

Regional Poison Information Centers in Minnesota are located to provide service to physicians and hospitals by multi-county areas as follows:

POISON CENTERS

Hennepin, Scott, Sibley, Carver, McLeod, Wright
Abbott Hospital, FE 5-4201
Fairview Hospital, FE 6-6691
Minneapolis General Hospital, FE 3-1178
North Memorial Hospital, JU 8-2753
Northwestern Hospital, FE 2-7266

Ramsey, Dakota, Washington, Anoka, Chisago
Ancker Hospital, CA 2-7341
Bethesda Hospital, CA 4-7561
Children's Hospital, CA 7-6521
St. John's Hospital, PR 1-5521
St. Joseph's Hospital, CA 2-6321
St. Luke's Hospital, CA 2-6644

Blue Earth, Freeborn, Waseca, Faribault, Martin, Watonwan, Brown, Nicollet, Le Sueur
Immanuel Hospital—Mankato, Mankato 8-1605

Nobles, Rock, Pipestone, Murray, Cottonwood, Jackson
Worthington Municipal Hospital, Worthington 2-5601

Ottertail, Becker, Clay, Wilkin, Grant, Douglas, Wadena, Norman, Mahnomen
Lake Region Hospital—Fergus Falls, Fergus Falls 523

St. Louis, Lake, Cook, Carlton, Pine, Itasca
St. Luke's Hospital—Duluth, RA 7-6636
Virginia Muncipal Hospital—Virginia, HA 1-3340

Kittson, Roseau, Marshall, Polk, Pennington, Red Lake
Bethesda Hospital—Crookston, AT 1-4682
St. Francis Hospital—Crookston, AT 1-2490

Lake-of-the-Woods, Koochiching, Beltrami, Clearwater, Hubbard
Bemidji Hospital—Bemidji, PL 1-5430

Cass, Crow Wing, Aitkin, Todd, Morrison
St. Joseph's Hospital—Brainerd, Brainerd 2861

Stearns, Benton, Mille Lacs, Kanabec, Isanti, Sherburne
St. Cloud Hospital—St. Cloud, BL 1-2700

Chippewa, Kandiyohi, Meeker, Renville
Rice Memorial Hospital—Willmar, BE 5-4543

Lac Qui Parle, Yellow Medicine, Lincoln, Lyon, Redwood
Louis Weiner Memorial Hospital—Marshall, Marshall 2263

Traverse, Big Stone, Stevens, Pope, Swift
Stevens County Memorial Hospital—Morris, Morris 1191

Rice, Steele, Goodhue, Dodge, Mower, Wabasha, Olmsted, Fillmore, Winona, Houston
St. Mary's Hospital—Rochester, AT 9-4581

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The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

WHY THE DOCTOR IS OUT

The opening paragraph of the President's Letter by Doctor Clarence Jacobson, published in the April issue of MINNESOTA MEDICINE, was as follows.

DOCTOR IS OUT

He is attending the 107th Annual Meeting of the Minnesota State Medical Association where he is hearing scientific lectures by the leading scientists of the nation and viewing the latest medical and surgical techniques and equipment, that he may better serve your medical needs

The Doctor is expected back in his office (hour).

This message, prepared in printed form, has been enclosed with the 1960 Annual Meeting program. Members are urged to post this explanation in a prominent place in their office during their absence to attend the Annual Meeting of the Minnesota State Medical Association, May 23, 24 and 25, 1960, in Rochester.

EFFECTIVE PR

Focusing on several areas where the public image of the medical profession needs polishing, AMA Director of Communications Leo E. Brown—in a recent speech before the Michigan Academy of General Practice—touched on some basic ingredients of effective public relations that bear repeating. "Good deeds and their proper interpretation," he underlined as "the fundamental precepts of effective public relations . . . If you haven't done anything there is no story to tell. On the other hand, if you refuse to tell your story you cannot expect to receive credit for it," he explained.

His recommendations for improving the doctor image in three major areas of public dissatisfaction—namely, service, communications and finances: "The individual physician . . . has a very real obligation to the profession to do all within his power to maintain high quality service, to take the time to discuss with the patient his physiological well being, and to impress upon him his sincere interest, plus a frank discussion of the cost involved." As for the profession as a whole, Brown diagnosed the problem as one of negative approach—"Effective medical public relations can no longer be viewed solely as a preventive or holding operation but as a creative, organized activity to strengthen the future of medicine."

IS THE FIELD ALSO RIPE UNTO HARVEST HERE?

Physicians in the State of Idaho, recognizing that their profession is one of the last outposts of private enterprise and independence, have organized Idahoans for Good Government and are enlisting membership of the medical profession of that State.

Aims and functions of the organization are as follows:

—To help elect persons sincerely interested in preserving private enterprise (whatever their political party).

—To purchase advertising in all news media.

—To tell Idahoans that their family physician has been forced to become politically active to preserve the American way of life.

—To seek the support of all thinking Idahoans in this campaign.

Governed by an advisory board made up of physicians representing each component medical society in the State, Idahoans for Good Government will promote its programs with a small budget furnished by MD contributions. An outline of the committee premises stresses that doctors must be:

—Active members in political parties of their choice.

—Willing to spend money to fight for freedom and independence from further governmental interference.

—Willing to tell patients, friends and others why this fight is necessary.

A recent Minnesota Poll has indicated that 55 per cent of this state's population approves of the idea of providing health and medical care as part of the Social Security care for senior citizens.

Perhaps a similar organization in our State using comparable methods could help to inform Minnesotans regarding the high quality of medical care which they already enjoy.

MEDICAL EDUCATION AIDS LISTED

A program to attract talented high school and college students to the study of medicine has been outlined by the American Medical Association and the Association of American Medical Colleges.

The program points out that because medical school is many years ahead of the high school student, an aspiring medical student should concentrate on getting a broad, liberal education in his pre-medical school studies. Medical schools and the medical profession could do a service to high school faculty advisers and vocational guidance counsellors by making known the fact that vacancies do and will exist in U. S. medical schools. Medical careers informational media would help the high school counsellors by making the opportunities and rewards of medicine better known to their students.

Proper Pre-Medical Courses Important

The well-prepared and qualified students will be accepted into medical school. However, the student should learn the admissions requirements of specific schools so that he will follow the prescribed basic curriculum. An increase in the needs for more students in the future may be expected because of increasing population and the variety of careers being developed through medical progress—in research, teaching, practice and administration.

Because of the increased competition from other professions for the talented students, programs are being developed by AMA and AAMC to stimulate these students toward medicine.

Recruitment Aids Available

Services now available to state and county medical societies and medical schools to highlight the opportunities in medicine include the following new materials: (1) a 25-minute 16 mm color and sound motion picture entitled "I Am A Doctor"; a comprehensive handbook on "Medicine as A Career" for distribution to high school and college advisers containing a summary of high school, college, and medical school information to be used in counselling work; a brief pamphlet for wide-scale distribution to students, and a major exhibit on "Medicine . . . The Most Demanding Rewarding Profession" for showing at "career days," health fairs, and large community gatherings. These printed materials are available to medical societies and medical schools and the film and exhibit may be requested from the AMA or from your State Office.

ANTIDOTE FOR HIDDEN HAZARDS

A new booklet entitled "Hidden Hazards—the Unlabeled Poison Problem" by AMA's Committee on Toxicology has been mailed to chambers of commerce, poison control centers, communications media, farm and grange publications and other groups.

The American Medical Association is urging passage of federal legislation requiring precautionary labeling of all hazardous substances used in home and industry which are not now required by law to carry warnings.

The American Medical Association urges all state and county medical societies to launch educational programs based on this booklet as well as to inform congressmen of their official support of the bill. A special program-planning section has been inserted in copies going to medical societies to aid in planning these campaigns.

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By so doing Aldactone establishes a fundamentally new and effective approach to the control of edema or ascites, including edema resistant or unresponsive to conventional diuretic agents.

Further, because of its different site and mode of action in the renal tubules, Aldactone has a true, highly valuable synergistic activity when used with a mercurial or thiazide diuretic.

What Physicians May Expect of Aldactone

It is fully expected that Aldactone will change present medical concepts of the therapeutic limitations of managing edema. Many patients living in a greater or lesser state of edematous invalidism can now be edema-free. To others, gravely ill, Aldactone will be life-saving.

When used alone, Aldactone will produce a satisfactory diuresis in about half of those patients whose edema is resistant to conventional diuretic agents.

When Aldactone is used in a comprehensive therapeutic regimen, which includes a mercurial or a thiazide diuretic, a satisfactory diuresis and relief of edema may be expected in approximately 85 per cent of edematous patients *who would not otherwise respond.*

DOSAGE: For most adult patients the optimal dosage of Aldactone, brand of spironolactone, is 100 mg. four times daily. Aldactone should be administered for at least four or five days before appraising the initial response, since the onset of therapeutic effect is gradual when it is used alone. Aldactone manifests accelerated activity with greater response as early as the first and second days when used in combination with a mercurial or thiazide diuretic.

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Minnesota Blue Shield

SENIOR CITIZENS PLAN

Minnesota Blue Shield is currently enrolling subscribers in the Senior Citizens Plan, which provides medical-surgical coverage for persons sixty-five years of age and over. The enrollment period, May 1 through June 20, was scheduled to include both Mother's Day and Father's Day. Advertising messages suggest the Senior Citizens Plan as a Mother's or Father's Day gift.

This plan, which was introduced last October, provides benefits for 120 days of in-hospital medical care for each unrelated non-surgical illness during any twelve consecutive months; the full range of Blue Shield surgical benefits whether the surgery is performed in the hospital, the home, or in the doctor's office; electroshock therapy, x-ray treatment for specific conditions, and certain anesthesia services and endoscopic examinations. Also included are benefits for maximums of $50 of diagnostic x-ray services and $50 of laboratory services per subscriber in each period of twelve consecutive months, when such services are performed in the doctor's office, the patient's home, or in the out-patient department of a hospital.

No physical examination is required for Senior Citizen Plan applicants. There is a six months' waiting period, however, before benefits may be received for any pre-existing condition.

Applications for this Senior Citizens Plan will be accepted only during enrollment periods. The last enrollment period was conducted in October, 1959.

During this current enrollment period, a new plan for promoting non-group enrollment through drug stores is being tested. Folders describing rates and benefits, and including an application blank, will be made available in drug stores throughout the state.

The application blank, included in the folder, will be a postpaid card, addressed to Minnesota Blue Shield. As in the past, participating doctors will also be asked to offer the folders and application blanks in their waiting rooms.

A two-week program of radio messages will inform listeners that the applications are readily available at their local drug store or doctor's office.

The Minnesota State Pharmaceutical Association is cooperating with Minnesota Blue Shield, in asking pharmacists to place the folders in their drug stores.

In announcing the enrollment period, Dr. C. A. McKinlay, President of the Minnesota Blue Shield Board of Directors, said, "It is hoped that participating doctors will assume an active role in bringing the benefits of the Senior Citizens Plan to their patients who are sixty-five years of age or over. Members of the medical profession are deeply aware of the needs of patients in this age group, and recognize that low-cost coverage like that provided by the Senior Citizens Plan is a significant step toward meeting the pressure for government intervention in health care for older citizens."

Contracts will be effective on the first or fifteenth day of the month after receipt of completed application.

The cost of the Senior Citizen Plan is $2.95 per month for each subscriber payable quarterly.

* * *

Representatives of Minnesota Blue Shield are continuing to attend meetings of county medical societies throughout the state to report directly to doctors on the Blue Shield program.

Such reports have already been made to a number of societies, Dr. Richard R. Cranmer, Executive Director of Minnesota Blue Shield, said.

"We are hoping to have representatives appear before all of the societies in the state in the months to come," he said.

"The society meetings are affording an excellent opportunity to explain recent developments at Blue Shield, and answer any questions members may have."

"We welcome these opportunities to establish an even closer relationship with members of the medical profession."

A number of the county socities have adopted resolutions commending Minnesota Blue Shield on its program, particularly its introduction of benefits for diagnostic x-ray and laboratory services, when performed in the patient's home, doctor's office, or out-patient department of a hospital.

as it calms anxiety!

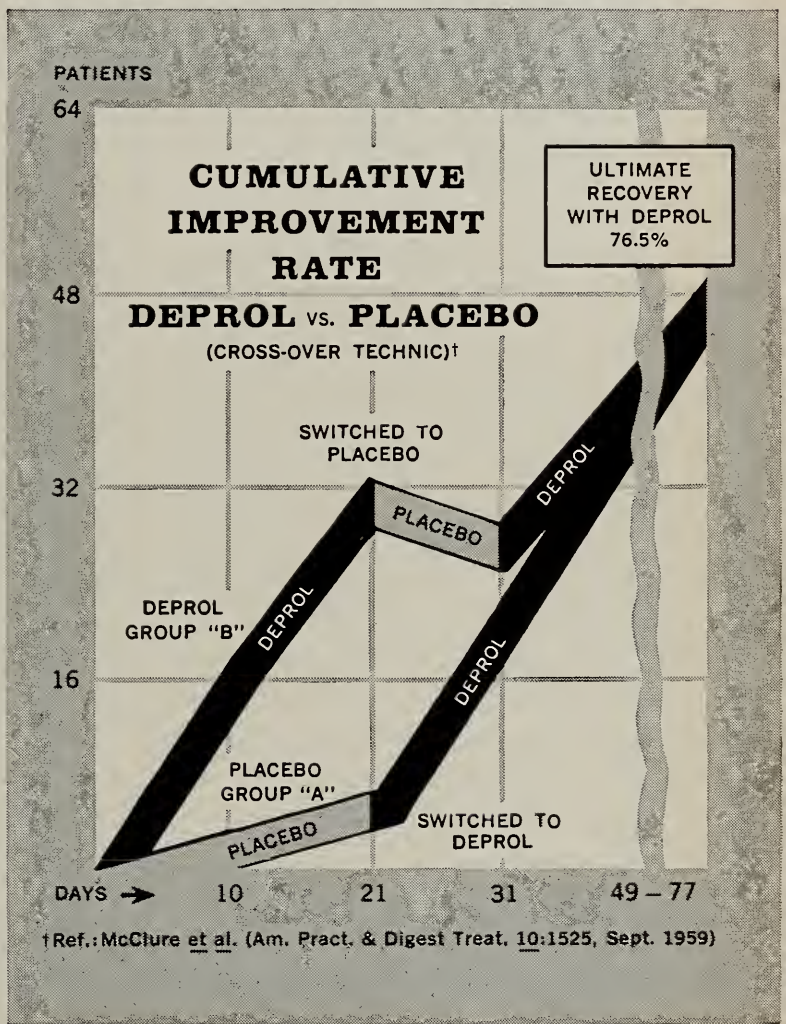
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Balances the mood – no "seesaw" effect of amphetamine-barbiturates and energizers. While amphetamines and energizers may stimulate the patient – *they often aggravate anxiety and tension.* And although amphetamine-barbiturate combinations may counteract excessive stimulation – *they often deepen depression.*

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Acts swiftly – the patient often feels better, sleeps better, within two or three days. Unlike the delayed action of most other antidepressant drugs, which may take two to six weeks to bring results, Deprol relieves the patient quickly – often within two or three days.

Acts safely – no danger of liver damage. Deprol does not produce liver damage, hypotension, psychotic reactions or changes in sexual function – frequently reported with other antidepressant drugs.



BIBLIOGRAPHY *(11 clinical studies, 764 patients):*

1. Alexander, L. (35 patients): Chemotherapy of depression – Use of meprobamate combined with benactyzine (2-diethylaminoethyl benzilate) hydrochloride. J.A.M.A. 166:1019, March 1, 195B. **2.** Bateman, J. C. and Carlton, H. N. (50 patients): Meprobamate and benactyzine hydrochloride (Deprol) as adjunctive therapy for patients with advanced cancer. Antibiotic Med. & Clin. Therapy 6:648, Nov. 1959. **3.** Bell, J. L., Tauber, H., Santy, A. and Pulito, F. (77 patients): Treatment of depressive states in office practice. Dis. Nerv. System 20:263, June 1959. **4.** Breitner, C. (31 patients): On mental depressions. Dis. Nerv. System 20:142, (Section Two), May 1959. **5.** Landman, M. E. (50 patients): Choosing the right drug for the patient. Submitted for publication, 1960. **6.** McClure, C. W., Papas, P. N., Speare, G. S., Palmer, E., Slattery, J. J., Konefal, S. H., Henken, B. S., Wood, C. A. and Ceresia, G. B. (128 patients): Treatment of depression–New technics and therapy. Am. Pract. & Digest Treat. 10:1525, Sept. 1959. **7.** Pennington, V. M. (135 patients): Meprobamate-benactyzine (Deprol) in the treatment of chronic brain syndrome, schizophrenia and senility. J. Am. Geriatrics Soc. 7:656, Aug. 1959. **8.** Rickels, K. and Ewing, J. H. (35 patients): Deprol in depressive conditions. Dis. Nerv. System 20:364, (Section One), Aug. 1959. **9.** Ruchwarger, A. (87 patients): Use of Deprol (meprobamate combined with benactyzine hydrochloride) in the office treatment of depression. M. Ann. District of Columbia 28:438, Aug. 1959. **10.** Settel, E. (52 patients): Treatment of depression in the elderly with a meprobamate-benactyzine hydrochloride combination (Deprol). Antibiotic Med. & Clin. Therapy 7:28, Jan. 1960. **11.** Splitter, S. R. (84 patients): The care of the anxious and the depressed. Submitted for publication, 1959.

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Communications

TRENDS IN BLUE CROSS-BLUE SHIELD

The American Hospital Association is initiating an effort to weld all of the Blue Cross Plans into one American Blue Cross Plan. It is proposed that the AHA, AMA and the American Dental Association would work together in the development of this Blue Cross Plan. It is not clear as to what relationship would exist between this national Blue Cross Plan and the Blue Shield Plans. An article by Michael M. Davis, Ph.D., in the February 1960 issue of *Modern Hospital* suggests, however, that Blue Shield is a handicap to Blue Cross in its efforts to meet current demands for a larger scope of insurance services because Blue Shield will not face these demands with readiness and flexibility. It is suggested in this article that Blue Shield might be by-passed when it could not be persuaded to follow the Blue Cross lead, and it is also proposed that the hospitals be prepared to stand behind Blue Cross in an effort to include in one Blue Cross prepaid contract all x-ray and laboratory services, both inpatient and outpatient, as well as a still wider scope of physicians' services. It would seem that an effort is being made to develop a trend for a national Blue Cross Plan which would supplant all local Blue Cross Plans and which would take over in part, at least. present coverage offered by the Blue Shield Plans.

Frank C. Coleman, M.D.

FINANCIAL AID TO MEDICAL STUDENTS

One basic approach to the understanding of medical students' financial standing is to examine the facts concerning student indebtedness. Some recent findings concerning the experience of the 1959 graduating class are summarized below.

MEDICAL STUDENT FINANCES

1.	Number of Students in 1959 Graduating Class	6,799
2.	Average Cost of Four Years of Medical School to the Students in the 1959 Graduating Class	$ 11,642
3.	Estimated Total Cost of Four Years of Medical School to All Students of 1959 Graduating Class	$80,000,000
4.	Percent of Students in 1959 Graduating Class Who Have Liabilities From Any Source	52%
5.	Number of Students in 1959 Graduating Class Who Have Loan Liabilities Directly Related to Their Medical Education and Whose Total Liabilities are Greater Than Their Total Assets (Students Who Need Financial Assistance)	2,257
6.	Percent of Above Type of Students in 1959 Graduating Class	33%
7.	Total Liabilities of This Group of Students	$12,450,786
8.	Total Assets of This Group of Students	$ 2,841,716
9.	Total Indebtedness (Net Liability) of This Group of Students	$ 9,609,070
10.	Average Indebtedness (Net Liability) Per Student of This Group of Students	$ 4,258

A second factor bearing on the medical student's financial standing is his ability to pay for a medical education. This ability derives largely from the level of his father's income and the degree of financial responsibility he currently bears for his family's welfare.

The question of what method shall be used to give financial aid to medical students is a complex one. This issue must be studied in terms of the degree of responsibility which should be shouldered by the individual for his own education and the degree of responsibility which should be shouldered by the society which benefits from medical practice. The 1957 Report of the President's Committee on Education Beyond High School cites the following statement concerning these issues:

"Some hold that, because the individual gains from education, and because education beyond high school is voluntary, it is the responsibility of the individual to pay for the services he gets. Others hold that society should provide free educational opportunities as long as they are using them advantageously, because society cannot survive and prosper without an educated citizenry. Neither point of view has persuaded the majority of our citizens."

If society aided the medical student from the first point of view, it would do so by *granting loans* which would be repaid to the grantor. Aid to medical students from the second point of view would be derived from *non-refundable grants or scholarships.* A proper balance should be found between these two methods.

The medical student himself constitutes one source of opinion in respect to the balance between these methods of financial aid. Data on the 1959 graduating class of medical students points to the fact that the students favor a 50-50 division between loans and scholarships as a basis of financial aid. Given this proposition, excluding the scholarships that have regularly been available, what are the dimensions of the additional help needed by the medical students?* The table below represents an estimate of the answer to this question based on the experience and the opinion of the 1959 graduating class.

SUMMARY INFORMATION

1.	Total Indebtedness of Members of 1959 Graduating Class Who Have Loan Liabilities and Whose Total Liabilities are Greater Than Their Total Assets	$9,609,070
2.	Estimate of Average Indebtedness of These Students per Medical School Year If Indebtedness Were Evenly Distributed	$2,400,000
3.	Estimated Cost of Financial Aid per Medical School Year If Enough Scholarships are Provided to Decrease Debt of These Students By 50%	$1,200,000
4.	Estimated Total Amount of Additional Scholarships Per Year for All Four Classes in Medical School	$4,800,000

Association of American Medical Colleges

*Approximate total amount of scholarship aid received by the 1959 graduating students: $2.88 million. (If evenly distributed over the four years: $720,000 per year for this class.)

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

LATEST "MARCH OF MEDICINE" FEATURES "MD USA"

The latest in the Smith Kline & French Laboratories' "March of Medicine" series will be previewed Monday, May 23, 8:00-9:00 p.m. at the Mayo Civic Auditorium in conjunction with the annual meeting of the Minnesota State Medical Association. "MD USA," an unusual color documentary which gives insights into the skill and understanding of free American physicians as they practice in widely scattered sections of the nation, will be seen on KSTP-TV—Channel 5, Twin Cities, May 27, at 7:30 p.m. CDT. Viewers in other areas are advised to consult local NBC-TV listings.

The "March of Medicine" series, which is produced by SK & F in cooperation with the American Medical Association, began in 1952. Its programs have won numerous honors including the first Albert Lasker Award for medical journalism in television. "MD International," a documentary on American doctors in foreign lands, last year received the George Foster Peabody Award for "outstanding contribution to international understanding." In addition, the author of this show, Lou Hazam, was presented with a Christopher Award for his writing. He also has prepared the script for the new program, "MD USA."

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In Memoriam

JACOB BIEDERMANN

Final rites for Dr. Jacob Biedermann, Thief River Falls physician for forty-three years, were held Saturday, March 5, 1960, in that city.

Doctor Biedermann died Tuesday, March 1, 1960, in Minneapolis at the age of eighty-four. He was born at Star Prairie, Wisconsin, June 14, 1875, where he attended grade school, and he attended high school in Stillwater. He graduated from the University of Minnesota Medical School in 1904 and interned at a Stillwater hospital from 1904 to 1906.

In 1906, he established a practice in Argyle and was there until 1915 when he moved to Thief River Falls, maintaining an office in the present Elks Building. He retired from practice in 1958 and moved to Austin, where he lived with his son, Dr. George Biedermann, for some time. In 1959, he moved to Minneapolis, where he had made his home since that time.

Doctor Biedermann during his long practice in Thief River Falls was affiliated with Physicians Hospital, later Northwestern Hospital.

He was a member of the Red River Valley Medical Society, the Minnesota State Medical Association and the American Medical Association. He received his Fifty-Club membership in 1954 from the Minnesota State Medical Association.

Surviving are one daughter and three sons: Mrs. Robert Conger (Mary Alice) of Haddonfield, New Jersey; Robert of Minneapolis; Dr. George of Austin; and Dr. John of Lake Forrest, Illinois. He was preceded in death by his wife.

MAURICE D. COOPER

Dr. Maurice D. Cooper, a pioneer Winnebago physician, died March 25, 1960, at Methodist Hospital in St. Louis Park. He was seventy-eight years of age at the time of his death.

Doctor Cooper came to Winnebago in 1908, following graduation from the School of Medicine at the University of Minnesota. On July 4, 1909, he was married to Miss Gertrude Shardi of Minneapolis. Mrs. Cooper died last fall.

Active and interested in civic affairs of his community, Doctor Cooper for many years was active in the Town and Country Club, the Kiwanis Club, the Winnebago Sportsman's Club, and many other organizations. The Community Club tendered Doctor Cooper a dinner in his honor in 1946.

A physician of the "old school", Doctor Cooper was educated at the Parksville, Missouri, Academy and at the University of Minnesota, where he earned his M.D. degree in 1907. In recent years, he had been associated in the practice of medicine and surgery with Dr. J. L. Mills.

Doctor Cooper was a member of the Blue Earth Valley Medical Society, the Minnesota State Medical Association, the American Medical Association, and the Tri-State Medical Association. He had served as advisor to the Cedar Valley Area Council of the Boy Scouts; as a director of the Winnebago Chapter of the Red Cross; Director and Secretary of the Community Club, and President of the Riverside Town and Country Club.

There are three surviving children: a daughter, Mrs. Marshall (Doris Jean) Sawyer of Golden Valley; and two sons, Merlin, Phoenix, Arizona, and Preston, Granada Hills, California.

JAMES R. ELSEY

Dr. James R. Elsey, Glenwood physician and surgeon, died March 20, 1960, at the age of eighty-nine years.

Doctor Elsey was born June 11, 1870, in Northwood, Ohio, and moved to Minnesota as a young boy of twelve with his parents, the Reverend and Mrs. Edward G. Elsey.

He attended Geneva College in Beaver Falls, Pennsylvania, and graduated from George Washington University Medical School in St. Louis, Missouri. He was married to Bertha Ellen McClintock, March 21, 1900.

After practicing medicine for four years in Houston and Monmouth, Ohio, and Chokio, Minnesota, Doctor Elsey moved to Glenwood in 1904 and practiced there until his retirement in 1948.

During World War I, he served as an army surgeon with the occupation army in Germany.

Doctor Elsey was the first commander J-R-D Post of the American Legion in 1920, and also served as Mayor of Glenwood City.

He was a member of the West Central Minnesota Medical Society, the Minnesota State Medical Association and the American Medical Association. In 1947, the Minnesota State Medical Association granted him Life Membership, and in 1951, he was granted membership in the Fifty-Club of the State Association. The community of Glenwood honored Doctor Elsey in 1948, for fifty years of medical practice.

Surviving are one sister, Edna Elsey, Ferndale, Michigan, and three grandchildren, Roberta, William and Gweneth Elsey, all of Glenwood.

EMANUEL S. LIPPMAN

Dr. Emanuel S. Lippman, Minneapolis pediatrician, died February 24, 1960, at the age of fifty-four years.

He was a lifelong Minneapolis resident, a graduate of the University of Minnesota Medical School, an Assistant Clinical Professor of Pediatrics at the University of Minnesota and former Chief of Pediatrics at Mount Sinai Hospital.

His professional memberships included the American Board of Pediatricians, American Academy of Pediatrics, Northwest Pediatrics Society, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Doctor Lippman was a member of Beth El Synagogue.

(Continued on Page A-70)

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1. Projection from Vital Statistics, U.S. Government Dept. HEW, Vol. 48, No. 14, 1958, p. 398.
2. Modell, W.: Drugs of Choice 1958-1959, St. Louis, C. V. Mosby Company, 1958, p. 347.

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EMANUEL S. LIPPMAN

(Continued from Page A-68)

He served overseas with the rank of Major during World War II.

Survivors include his wife, Helen A.; a son, Harry S.; a daughter, Cathie-Ann; his mother, Mrs. Katie Lippman, all of Minneapolis, and four brothers, Laby, Minneapolis; Dr. Hyman S., St. Paul; Lazarus, Seattle, Washington, and Sidney in New Jersey.

JAMES S. McCABE

Dr. James S. McCabe, of Mendota Heights, died April 4, 1960, at the age of forty-seven years.

Doctor McCabe was graduated from Louisiana State University in 1939 and was Chief of Staff in Obstetrics at St. Luke's Hospital in 1957. He was a veteran of World War II.

Doctor McCabe was a member of the Ramsey County Medical Society, the Minnesota State Medical Association, the American Medical Association, and the Minnesota Obstetrical and Gynecological Society.

Survivors include his wife, Marion C., daughters, Patricia, Diane and Frances, and sons, James S. and Hugh Bernard, all of Mendota Heights, and sisters, Mrs. O. C. Sehnert, Barrington, Illinois, Mrs. Herbert Shipman of Niles, Illinois, and Mrs. Anthony Peters, Chicago, Illinois.

MARY McCOY

Dr. Mary McCoy, Duluth's first woman physician, died September 14, 1959, at the age of ninety-nine years.

She was born November 11, 1859, in Waterloo, Michigan. Her education included two years of general education at Chelsea College and three years at the University of Michigan School of Medicine. After serving for two years as an anatomy instructor at the University, she began the practice of medicine in Duluth in 1890.

Doctor McCoy was active in the woman suffrage movement in Duluth prior to the adoption of the 19th amendment of the U. S. Constitution.

Doctor McCoy retired when she was about seventy-eight. Her husband was Royce McCoy, a Duluth bookkeeper.

Doctor McCoy was honored May 12, 1958, with thirteen men physicians for long service to the medical profession at a dinner in the Northland Country Club, Duluth.

Doctor McCoy was a member of Pilgrim Congregational Church, a life member of Zenith Chapter, Order of Eastern Star and was a member of the St. Louis County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Surviving is a sister, Mrs. Pauline Polrer, Wentworth, Wisconsin; two grandchildren, and four great-grandchildren.

CARLE B. McKAIG

Dr. Carle B. McKaig, who served as a doctor in the Pine Island village and surrounding area for fifty-three years, died March 20, 1960, in St. Mary's Hospital in Rochester after an illness of about four weeks. Doctor

McKaig was seventy-seven years old at the time of his death.

For twenty-seven years, he served as a member of the Pine Island School Board. For twenty-five of those years, he was chairman. Doctor McKaig was Pine Island's Health Officer for a quarter of a century. For many years, he served as Chief of Staff of the Zumbrota Community Hospital. Doctor McKaig was also President of the Olmsted County Medical Society, now the Zumbro Valley Medical Society, and the Southern Minnesota Medical Society.

Doctor McKaig was born in Warsaw, Indiana, the sixth child in a family of ten, on June 24, 1882. The family lived in Lincoln, York, and Omaha, Nebraska, Minneapolis and Sioux City, Iowa, in later years.

He attended Morningside College, graduating with a B.S. degree. In 1906, he graduated from the Sioux City College of Medicine and came to Pine Island in 1907.

Doctor McKaig was a member of the Zumbro Valley Medical Society, the Minnesota State Medical Association, and the American Medical Association. In 1957, he was honored for observance of fifty years of practice by the Minnesota State Medical Association.

Survivors include a daughter, Mrs. James Spuhler, Ann Arbor, Michigan; a brother, Ray, of Boise, Idaho; and sisters, Mrs. Frank Lake, of Sioux City, Iowa, and Mrs. A. B. Copeman of Grundy Center, Iowa.

HARRY NICHOLAS SUTHERLAND

Dr. Harry N. Sutherland, Ely, passed away February 28, 1960, at the age of seventy-five.

Doctor Sutherland was associated with Doctors Ayres and Parker at the Shipman Hospital from 1913 to 1942. He was a junior partner with Doctor Ayres from 1942-44 and was a senior partner in the firm of Doctors Sutherland and Grahek from 1944-1954. He also served as city health officer for fourteen years.

Doctor Sutherland was born in Madison, Wisconsin, on March 14, 1884, and graduated from Central High School in Madison in 1904. He graduated from the University of Wisconsin in 1909, and completed his studies in 1912 at Rush Medical College. He served his internship at the Children's Memorial Hospital, Chicago, in 1912-1913.

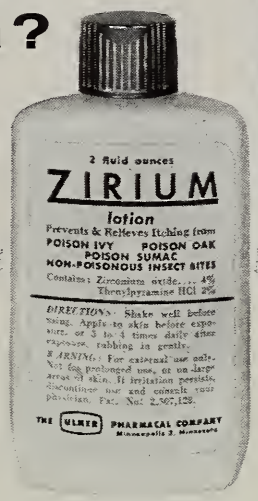
He was a member of the Presbyterian church, an honorary member of Kiwanis International, and had been a member of the Masons (A.F. and A.M. Lodge) for fifty-four years. He was a charter member of the Wisconsin Chapter of the Acacia fraternity, was a member of the Phi Rho Sigma medical fraternity, and was a member of the Range County Medical Society, a life member of the Minnesota State Medical Association, and the American Medical Association.

Surviving are his wife, Doris; one daughter, Mrs. Jack Beuk (Carolann), Hinsdale, Illinois; two sons, Harry Sutherland, Ferguson, Missouri, and George Sutherland, Silver Bay, Minnesota, and eleven grandchildren. Also listed among the survivors are three sisters.

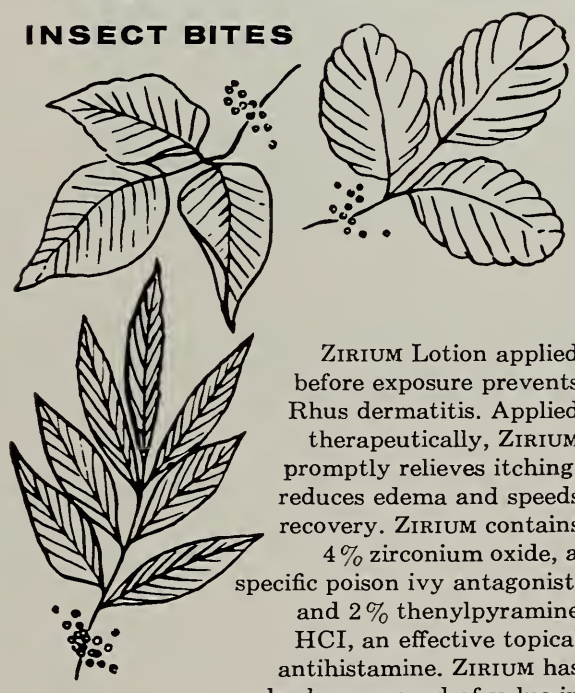
JOHN FELIX TRAXLER

Dr. John F. Traxler, physician and surgeon who had practiced at Henderson, Minnesota, since 1916, died

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April 11, 1960. Doctor Traxler was sixty-nine years of age at the time of his death.

Born at Le Center, Doctor Traxler studied in the high school there, at St. Thomas Academy, St. Paul, and St. John's University, Collegeville. He was graduated from Creighton University School of Medicine, Omaha, in 1915. After spending a year's internship in St. Joseph's Hospital, St. Paul, he began his practice at Henderson in 1916.

He served as a Lieutenant in World War I, and was the first commander of the American Legion post at Henderson.

He had served as a member of the Henderson school board and was a past president of the Nicollet-Le Sueur Medical Society. He also belonged to the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Marie; four daughters, Mrs. Harry Holtz, Mrs. George H. Smith and Kitty Jo of St. Paul, and Sister Mary Peter of the School Sisters of Notre Dame, of New England, North Dakota; six brothers and two sisters, Martin, Theodore, Raymond and Mrs. Michael Kehoe of Le Center, and Nicholas, Mankato, Neil and Francis of Minneapolis, and Mrs. Michael Reardon of New York. Six grandchildren also survive.

HARRY B. ZIMMERMANN

Dr. Harry B. Zimmermann, retired chief of the Miller Hospital (St. Paul) medical staff and widely-known St. Paul surgeon, died March 11, 1960, at St. Petersburg, Florida.

Doctor Zimmermann, a native of St. Paul, was Emeritus Clinical Professor of Surgery at the University of Minnesota Medical School and Vice President of the Board of Directors of Miller Hospital.

He began his medical career in 1911, two years after graduation from the Columbia University College of Physicians and Surgeons.

After passing the state medical board examination in St. Paul, Doctor Zimmermann returned to New York where he served at the Manhattan Maternity, Bellevue and New York hospitals.

He was resident surgeon general in New York General Memorial Hospital before returning to St. Paul in 1913.

During World War I, he served overseas with a base hospital and in World War II he was senior consulting surgeon at Veterans Hospital in St. Paul.

He was a member of the Council of the Minnesota Historical Society and was on the Hallie Q. Brown Community House Board of Directors.

He served as consulting surgeon at St. Luke's and Shriners Hospitals and as a member of the staff of Mount Sinai Hospital, Minneapolis.

A member of the Ramsey County Medical Society, Doctor Zimmermann was granted life membership in the Minnesota State Medical Association in 1956. He was also a member of the American Medical Association.

He is survived by his wife, Mary P., and a son, Dr. Bernard Zimmermann, St. Paul; a daughter, Mrs. David Minard of Bethesda, Maryland; a sister, Mrs. Emil E. Nelson of St. Paul, and six grandchildren.

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1. Hinkel, E. T., Jr.; Fisher, M. P., and Tainter, M. L.: *J. Am. Pharm. A. (Scient. Ed.)* 48:380, July, 1959. 2. Hinkel, E. T., Jr.; Fisher, M. P., and Tainter, M. L.: *J. Am. Pharm. A. (Scient. Ed.)* 48:384, July, 1959.

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The Physician's Diary

Drs. F. E. Mork and **Harold Mork**, of the Mork Clinic in Anoka, announce the appointment of **Dr. Herman D. Bentz** to their staff. Doctor Bentz is a native of Grand Rapids, Minnesota, and a graduate of the University of Minnesota Medical School. He will serve the Clinic in the capacity of surgeon.

* * *

Virginia, Minnesota, physicians, **Drs. D. J. Richter** and **T. J. Gerend**, recently attended postgraduate sessions. Doctor Richter attended the Chicago Medical Society Postgraduate Clinical Conference and Doctor Gerend attended a Pediatrics Symposium in Kansas.

* * *

Dr. C. W. Truesdale, Glencoe, has received notice that he has been appointed to the Governor's Citizens Committee on Aging. He will serve specifically on the nursing home classification subcommittee.

* * *

The Alpha Chapter of the Alpha Omega Alpha at the University of Nebraska College of Medicine has elected **Dr. John C. Ivins**, Mayo Clinic, to alumni membership. Doctor Ivins is a 1939 graduate of the school.

* * *

Two Minneapolis physicians, **Drs. Albert J. Greenberg** and **Arthur C. Kerkhof**, represented Minnesota at the American Society of Internal Medicine annual meeting in San Francisco, California, April 1-3, 1960.

* * *

Dr. E. C. Burseth, Mora, has been elected President of the Kanabec County Association for Mental Health. The group recently held a board orientation meeting for prospective board members.

* * *

"Results of a Specific Investigation in the Circulatory System" was the subject of a talk by **Dr. Hiram Essex**, retired Mayo Clinic physician, to senior students of advanced ability. A complete survey of the results of the investigation were covered and interesting films taken during it were shown.

* * *

Dr. M. M. Hargraves, Mayo Clinic, spoke to a Downtown Kiwanis Club in Rochester in March. "Environmental Hazards in the Cause of Disease" was the topic of discussion at the meeting. Doctor Hargraves warned that leukemia and other blood diseases are part of the price mankind is paying for progress.

* * *

President of the Northern Association for Medical Education, **Dr. Davitt A. Felder**, St. Paul, has announced the appointment of John W. Hedback as Executive Director of the Association. Mr. Hedback has been Executive Secretary of the American Medical Association's Education Foundation for the past five years.

* * *

A senior consultant in otolaryngology at the Mayo Clinic, **Dr. Henry L. Williams** has been elected President of the American Otological Society. The election took place at the Society's annual meeting in Miami, Florida.

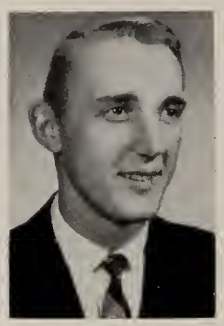
* * *

Dr. Hendrik J. Svien, Mayo Clinic, has been elected an honorary member of the St. Olaf College chapter of Phi Beta Kappa, national honor society for scholarship.

* * *

Fulda, Minnesota, now has the services of **Dr. Fouad Sukkar**, formerly of St. Paul. Doctor Sukkar is a native of British Sudan, North Central Africa, and graduated from the British Medical School of Alexandria, University of Alexandria, Egypt.

RURAL MEDICAL SCHOLARSHIP AWARDED



A University of Minnesota Medical School freshman who likes people and believes that he can serve them best through science, has been awarded the 1959 Rural Medical Scholarship presented annually by the Minnesota State Medical Association.

The eighth recipient of the $4,000 scholarship is George Bruce Gerstenkorn, a native of Belgrade, Minnesota. According to the terms of the scholarship, Mr. Gerstenkorn will receive $1,000 each year for four years with the provision that he promises to practice medicine for at least five years in a Minnesota community in need of a doctor.

The son of Mrs. Clara Gerstenkorn of Belgrade, the twenty-two-year-old 1959 scholarship winner graduated from the public schools of that community in 1955. He received his pre-medical training at St. Olaf College in Northfield, Minnesota.

According to Dr. F. J. Elias, Duluth, chairman of the Rural Medical Scholarship Committee of the Minnesota State Medical Association, the scholarship has a dual purpose; to assist a worthy and outstanding student to meet the cost of medical education and to insure a future supply of physicians in non-metropolitan Minnesota communities.

Three previous winners of the rural medical scholarship are now in medical practice. They are: Richard Engwall, M.D., Ivanhoe; Leland Christenson, M.D., Maple Plain, and Myron Doebler, M.D., Ellendale. Carl E. Christenson, M.D., the fourth recipient, is currently completing his internship and will practice medicine in the western community of Clinton, Minnesota, after July 1, 1960.

Scholarship winners in training at the University of Minnesota Medical School, in addition to Mr. Gerstenkorn, are Edward S. Peterka, Aurora; Vincent R. Hunt, Anoka and LeRoy Mueller, Belle Plaine.

Two Mayo Clinic staff members have been named among sixty-one delegates to represent Minnesota at the White House Conference on Children and Youth. They are **Dr. George B. Logan** and **Dr. John S. Pearson.** Doctor Logan is from the Pediatrics Staff.

* * *

Dr. Bernard Zimmerman, St. Paul, has been appointed head of the West Virginia University Medical Center's Department of Surgery. Doctor Zimmerman is now a Professor in the Department of Surgery, University of Minnesota Medical School. His new appointment will be effective approximately July 1, 1960.

* * *

Dr. Hendrik J. Svien, Mayo Clinic neurosurgeon, addressed 600 foot specialists in Chicago at the three-day Tenth Annual Midwest Podiatry-Chiropody Conference. He spoke on neurosurgical conditions which manifest themselves in the feet.

* * *

Slayton physician, **Dr. Hugh D. Patterson,** recently spoke at a meeting in Lake Wilson, Minnesota. He spoke on ways of getting a doctor and how to treat him if one should come. Lake Wilson citizens have formed a Doctor Call Committee.

* * *

The St. Paul Dispatch of March 30, 1960, had a feature article on the Tumor Board of the St. Paul Chapter of the American Cancer Society. The Board is a group of medical men who banded together in the hope of acquiring more knowledge and exchanging ideas about cancer and helping its victims. It was originated in 1953 by Dr. Davitt A. Felder and is now headed by Dr. John Noble, Ancker Hospital and Dr. Lloyd D. MacLean, Chief of Surgery at Ancker. The Board meets from 8:00 a.m. to 9:00 a.m. the first and third Thursdays of every month to discuss cancer cases that have been submitted to them by medical men of the area.

* * *

Dr. Henry W. Meyerding, Mayo Clinic, was chosen one of the honorary sponsors of the centennial dinner of the New York Medical College. The dinner commemorated the founding of the New York Medical College at the outbreak of the Civil War.

* * *

A staff member of the Worthington Clinic since June 1948, **Dr. R. W. Robinett** has accepted an appointment as Instructor in the Department of Internal Medicine at the University of Michigan. Doctor Robinett will assume his duties in the Medical School at Ann Arbor on June 16. He will be assigned work in the field of allergies.

* * *

The Annual Clinical Reviews, a program of lectures and discussions on problems of current interest in general medicine and surgery was held in Rochester, April 4-6. Clinical Reviews is designed to be particularly useful to the doctor whose practice brings him into contact with the whole range of human illness. More than seventy Mayo Clinic consultants spoke, led discussions and con-



ferences and presented films. Members of the Clinical Reviews committee were **Dr. E. D. Bayrd**, chairman; **Dr. D. T. Carr, Dr. P. E. Bernatz, Dr. A. B. Hayles, Dr. R. C. Roesler** and **Dr. M. G. Brataas.**

* * *

Dr. H. D. Mori, formerly of Rochester, has opened practice in the Clinic Building in Grand Meadow. Doctor Mori is a native of San Pedro, California, and a graduate of the University of Chicago School of Medicine.

* * *

Dr. George E. Nelson, Jr., a former fellow in Orthopedic Surgery in the Mayo Foundation in Rochester, is now located in Minneapolis.

* * *

Doctors Memorial Hospital in Minneapolis has resumed its former name of Eitel Hospital. The hospital was named Eitel from the time it was founded in 1912 until 1954. The name, Doctors Memorial, was selected as a means of paying tribute to the physicians who had helped build its reputation for service to the community. Announcement of the name change was made jointly by **Dr. A. C. Olson**, President of the hospital's Board of Directors and Clarence R. Chaney, Vice President.

* * *

Dr. Jan H. Tillisch, Mayo Clinic, is chairman of the Board of Visitors of the Air University for 1960. The Board of Visitors of the Air University is composed of outstanding educators and business executives of the nation, and it meets at least once a year to evaluate the management, curriculum, methods of teaching and the facilities of the Air University, which is the professional education center of the U. S. Air Force.

* * *

Twenty-four fellows of the Mayo Foundation have completed their fellowships or terminated their periods of assignment. These include: **Drs. F. H. Bledsoe, P. J. Conner, Jr., H. A. Faust, Albert Frischknecht, E. P. Gerber, W. P. Keefe, W. C. Mitchell, G. E. Nelson, Jr., D. H. Overton, Jr., E. Q. Parr, J. A. Ramsdell**, and **D. L. Wilbur.**

* * *

A three-day session of the American College of Surgeons was scheduled for April 11-13, in Minneapolis. A special one-day program was held in Rochester April 14. Participating in the meetings were **Drs. N. Logan Leven, Dr. Norbert J. Lilleberg, Dr. Charles E. Rea** and **Dr. Wallace P. Ritchie**, all from St. Paul. Also participating were **Dr. Horace G. Scott, Dr. Yoshio Sako, Dr. Harold F. Buchstein** and **Dr. Owen H. Wangensteen** from Minneapolis; **Dr. Edward S. Judd** and **Dr. Joseph Pratt**, Rochester, and **Dr. Josiah Fuller of Duluth.**

* * *

Dr. Herman J. Moersch, senior consultant in medicine and a member of the staff of the Mayo Clinic since 1926, retired from the active practice of medicine on April 1, 1960, and shortly thereafter assumed the Post of Director of Education and Research for the American College of Chest Physicians. Doctor Moersch was born in St. Paul and received the degree of Doctor of Medicine in 1921 from the University of Minnesota. Doctor Moersch was President of the American College of Chest Physicians in 1956 and in the same year he was elected President of the staff of the Mayo Clinic. He is currently Vice Chairman of the Section on Diseases of the Chest of the American Medical Association and will advance to the post of Chairman in June, 1960.

* * *

Two films for women viewers were shown by the Ramsey County Cancer Society early in April at the Cancer Information Center. **Dr. Erick Y. Hakanson** and **Dr. Rodney Sturley**, St. Paul, presented a period for questions and discussions.

* * *

The "Town Topper" column in the *Minneapolis Star* recently contained a feature story on **Dr. Harlow Hanson**, health officer for Bloomington. Doctor Hanson has been Health Officer for thirty-four years in Bloomington. He is a native of Hutchinson and graduated from the University of Illinois Medical School.

* * *

Dr. David T. Carr, Mayo Clinic, was the guest speaker at a recent meeting of the Elton Hills PTA meeting. Doctor Carr showed slides and spoke on his four-day trip to Moscow, Russia.

* * *

Dr. Thomas B. Magath, internationally known authority on clinical pathology and parasitology, and a member of the staff of the Mayo Clinic since 1921, retired from active practice on April 1, 1960, and is residing in Sarasota, Florida. Doctor Magath was born in Oxford, Georgia, and received his degree of Doctor of Medicine from the University of Illinois College of Medicine in 1919.

* * *

Dr. and Mrs. L. H. Bendix of Annandale, recently returned from a two weeks' stay at Fort Lauderdale, Florida, where Doctor Bendix attended the two-week Minnesota Medi-Clinic sessions. The meetings were conducted by medical men from the University of Minnesota and from Minneapolis. **Dr. Robert Ransom**, Osseo, was also in attendance.

* * *

Dr. Giles A. Koelsche, consultant in medicine in the Mayo Clinic and Assistant Professor of Medicine in the Mayo Foundation, Graduate School, University of Minnesota, was installed as President of The American College of Allergists at the sixteenth annual meeting of

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the organization in Miami Beach, Florida. Doctor Koelsche was elected to the office at the 1959 meeting of the college in San Francisco.

* * *

Dr. J. Earle Estes, Jr., a member of the staff of the Mayo Clinic since 1948, and Assistant Professor of Medicine in the Mayo Foundation, Graduate School, University of Minnesota, has left the Mayo Clinic to establish a private practice in medicine, with special interest in peripheral vascular disease, in Phoenix, Arizona. Doctor Estes is a graduate of the University of Illinois Medical School.

* * *

Dr. Richard C. Lillehei, University of Minnesota Medical School, has been named a Markle scholar in Medical Science by the John and Mary R. Markle Foundation of New York. The appointment includes a $30,000 grant to the medical school, which will use it to pay Lillehei supplemental support funds and to aid his research for the next five years.

* * *

The East Range Clinic at Eveleth has announced the appointment of **Dr. D. W. Davies** to the staff. Doctor Davies formerly practiced in Harvey, North Dakota.

* * *

Members of the Hennepin County Medical Society recently heard a panel discuss the relationship between emotions and heart disease. Participating were **Dr. Jesse Barron,** Minneapolis, Moderator; **Dr. Thomas W. Martingly,** President Eisenhower's medical consultant; **Dr. Ralph Rossen,** Director of the L. E. Phillips Psycobiological Research Foundation, Minneapolis; **Dr. Milton W. Anderson,** Mayo Clinic; and **Dr. Richard M. Steinhilber,** Mayo Clinic.

* * *

The new president of the Stearns-Benton Medical Society is **Dr. L. H. Wittrock** of Watkins.

* * *

Dr. T. M. Hanson, Albert Lea, has received word of his election to membership in the American Academy of Allergy. The American Academy of Allergy is an association of physicians interested in the care of patients with allergies, such as hay fever, asthma, some migraine headaches and some of the skin disorders.

* * *

Members of the hospital staff in Redwood Falls honored **Dr. W. A. Brand,** Redwood Falls, on his eighty-fourth birthday.

* * *

Dr. Robert J. Meyer, health officer for Golden Valley, announced that he is moving to Bethany, Oklahoma, where he will continue in medical practice. Doctor Meyer has been in Golden Valley since 1954. **Dr. Stanley Stone** and **Dr. Wallace Anderson** have taken over Doctor Meyer's practice.

* * *

The Karlstad Hospital staff will have an addition next fall, when **Dr. Duane Pansegrau,** formerly of Sioux City, Iowa, joins the group.

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GENERAL PRACTITIONER needed after June 1. Community serving 2,500 or more people—west central Wisconsin. Excellent fishing and hunting areas near. Well-equipped office with present doctor—possible partnership later. Address E-724, care MINNESOTA MEDICINE.

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Pneumothorax—Traumatic and Spontaneous

Pneumothorax as a clinical entity has changed considerably over the past fifteen years. Tuberculosis is no longer the essential cause. The author reviews the newer knowledge of pneumothorax as to type, etiologic and physiologic mechanisms, diagnosis and treatment. As always, Kinsella's writings are clear, precise and practical.

THOMAS J. KINSELLA, M.D.
Minneapolis, Minnesota

PNEUMOTHORAX may be induced, traumatic or spontaneous in origin. To the average physician not in frequent contact with it, it is a somewhat mysterious and at times a very frightening condition. The following discussion is presented in an attempt to clarify some points concerning its types and treatment.

Induced Pneumothorax

Induced pneumothorax may be either therapeutic or diagnostic. Therapeutically, it was used very extensively in the past for the treatment of pulmonary tuberculosis, but has been almost completely abandoned since the introduction of the specific anti-tuberculosis drugs. Only a very few pneumothorax patients still remain from the thousands previously treated. Artificial pneumothorax in the presence of free pleural space provides a very effective means of control of recurrent pulmonary hemorrhage from tuberculosis or bronchiectasis.

Diagnostic Pneumothorax

Diagnostic pneumothorax may at times be of help to (1) localize tumor, (2) localize intrapulmonary bleeding, (3) visualize the diaphragm, (4) to replace pleural effusion, and (5) as a preliminary to thoracoscopy. The field for such, diagnostic pneumothorax, however, has been greatly reduced, by special radiographic techniques and the use of planigrams and bronchograms, by the development of right angle lens systems for bronchoscopy and by diagnostic cell study techniques

on sputum and aspirated bronchial secretions. Its use following aspiration of pleural fluid and followed by special x-ray films or thoracoscopy may in certain instances save an individual a major exploratory thoracotomy.

Traumatic Pneumothorax

Traumatic pneumothorax includes those which occur following gross trauma as well as the accidental variety which will be discussed separately. It may follow (1) crushing injuries of the chest, (2) a blow on the chest, (3) closed penetrating injuries as from a bullet or stab wound, (4) open penetrating wounds of the chest wall, (5) birth injury, (6) blast injury, (7) perforating foreign body of the esophagus, or (8) accidental pneumothorax.

The amount of trauma necessary for the production of pneumothorax may vary widely from an almost insignificant amount, a blow, a squeeze, a fall or a single fractured rib to a most severe crushing with multiple fractures or even disruption of the chest wall. A stab wound or bullet wound through the chest may be followed by pneumothorax, but not infrequently bleeding from the lung parenchyma occurs so rapidly that it seals the air vesicles preventing the escape of air and no pneumothorax follows. The passage of a baby through the birth canal is a traumatic crushing type of episode and this plus strenuous efforts at resuscitation may produce a pneumothorax. Blast injury from an explosion, from the rupture of a pneumatic tire, the opening of an air hose in close proximity to the patient's nose and mouth, or an over zealous attempt to expand the lung or to apply artificial respiration through an intratracheal tube may result in pneumothorax. Any sharp object impacted in the esophagus may perforate and if the adjacent lung is punctured, a pneumothorax may follow.

Accidental Pneumothorax

An accidental pneumothorax is one which is produced by some manipulation carried out by the physician. Most frequently, it results from puncture of the lung by a needle or by some manipulation or instrumentation which results in tearing of the pleura. A very common source of accidental pneumothorax previously seen was an attempt to induce an artificial pneumothorax or to refill a pleural pocket in which the lung was close to the chest wall. If the lung was punctured by the needle, air escaped through the wound into the free pleural space collapsing the lung to a greater or less degree. Aspiration of a clear or purulent pleural effusion could also result in collapse of the lung for the same reason, especially if an attempt was made to evacuate the pocket completely. It might also result from suction of air through an aspirating needle left unguarded as the aspirating syringe was emptied of fluid. Many a pneumothorax of this type was not recognized.

All of the classical sites shown in the text books for aspiration of the pericardial sac lie in an area where the pleural cavity or the lung or both must be traversed except the subcostal paraxyphoid puncture site. This is the most favorable site and it is the one which should be used instead of the anterior approach.

Attempts at needle biopsy of an intrathoracic tumor or the pleura may puncture the lung in a non-consolidated area and induce air leakage. A very effective way of establishing an accidental pneumothorax is to aspirate an air filled pulmonary cyst or emphysematous bleb. The straining incident to bronchoscopy or esophagoscopy may also result in an accidental collapse. The surgical operation of dorsal sympathectomy, rib resection, or radical breast operation in a patient with free pleural space may result in tearing of the pleura and collapse of the lung. A very high laparotomy or kidney incision may occasionally result in laceration of the diaphragm and pleura and produce a pneumothorax.

Spontaneous Pneumothorax

Spontaneous pneumothorax can be defined as a pneumothorax which appears out of a clear sky with no antecedent trauma, or manipulation. The margin between spontaneous pneumothorax and traumatic pneumothorax in industrial work may be so small as to be almost nebulous. The mechanism may even be the same, but if it occurs on the job or there is even the faintest hint of a traumatic factor, it is usually called a traumatic pneumothorax. Once thought to be indicative of pulmonary tuberculosis, it is now known to have no direct connection with this disease, although it may occur occasionally in tuberculous individuals through the same mechanism as in anyone else. If the cavity of tuberculosis or of a pulmonary abscess ruptures into the pleural space, a spontaneous pneumothorax follows, but almost immediately an extensive

and very virulent empyema develops leaving no doubt as to its origin. "Spontaneous" perforation of the esophagus usually occurs in the lower third of that structure with rupture into the mediastinum and then secondarily into the pleural cavity on one or both sides with mediastinal emphysema, tension pneumothorax, and empyema.

The most frequent cause of spontaneous pneumothorax is the rupture of a peripheral emphysematous bleb into free pleural space. The bleb may be large or small, most commonly on the small side with some even very minute in size. Such blebs are found in at least a third of normal individuals at the time of intrathoracic surgery and at postmortem examinations. Spontaneous pneumothorax occurs more frequently in younger people otherwise apparently healthy and less commonly among the older age group who have clinical emphysema, either of the interstitial or the bullous type, although it does occur in some of these patients.

These blebs are very thin walled, as delicate as thin tissue paper and rupture very easily. A localized peripheral bronchial obstruction with a check valve mechanism can cause local over-distention of tissue and bleb formation with rupture without any external strain or injury even during sleep. Air then leaks out into the pleural cavity the lung collapsing to a degree depending upon the freedom of the pleural space, the size of the leak and the amount of the check valve action in the local bronchus or in the wall of the bleb and perhaps upon the activity of the patient. The duration of the pneumothorax depends upon the continuation of the leak and the rate of air absorption from the pleural cavity and the treatment which is applied. Some pneumothoraces give a few or no symptoms, some are recognized only accidentally. Some are mistaken for pleurisy, while others give pain, tightness in the chest, and shortness of breath and a few go on to tension pneumothorax which, if reaching a considerable degree, may be a very serious or even fatal complication.

A tension pneumothorax is any pneumothorax in which pressure builds up to a degree which embarrasses the patient. This is not any particular point on the manometer but is related to the patient's vital capacity, respiratory reserve, the compressibility of the lung and flexibility of the mediastinum, as well as to the pressure in the pleural cavity. The deleterious effects of the tension result from the amount of collapse, from reduction of respiratory capacity, through displacement of the heart and mediastinal structures, from compression of the thin walled veins within the thorax interfering with return blood flow, from pain, or tightness, and from intrapleural bleeding if the lung or an adhesion is torn as the lung collapses.

Diagnosis

The first essential in making a diagnosis of pneumothorax of any type lies in thinking of the possibility of such a condition in any patient who has sustained trauma to the chest and in any patient complaining of chest pain or shortness of breath. It is then easy to diagnose. First there is splinting of the chest wall on the affected side, the percussion note over this side is resonant to hyper-resonant, the breath sounds are distant to absent although occasionally if some tension is present there may be an amphoric over-note to be heard. The heart and mediastinal structures may be shifted to the contralateral side with muffled to distant heart tones and a loss of the normal substernal dullness at the base of the heart and deviation of the trachea in the supersternal notch.

The smaller degree of pneumothorax are less readily recognized and x-ray films of the chest may be necessary in order to confirm the suspicion of the condition. A number of patients in whom the diagnosis of spontaneous pneumothorax has been made will give a history of one or more previous episodes of similar nature, diagnosed as pleurisy without x-ray studies and perhaps treated by chest strapping. It is quite probable that at least some of these previous attacks also were spontaneous pneumothorax. Some patients have no pain or other sensation except for a little tightness in the chest especially noticeable when bending over to lace the shoes. Chest roentgenograms early may show only a small apical rim of air easily missed on poor films or unless a careful study is made. Occasionally the condition is simultaneously bilateral. The amount of pneumothorax may at first be small but over a period of hours build up to a considerable volume.

Pneumothorax in traumatic situations may be less easily recognized. Chest pain, immobilization of the side and distant breath sounds, the result of the trauma may confuse the picture. The pneumothorax may be small or even absent at first but becomes evident subsequently because of increase in size following coughing, straining, or lung laceration from fractured ribs. When air and fluid are

present, the fluid level is easily recognizable if the patient is properly postured. The pneumothorax need not be on the side of the greatest trauma, hence may be overlooked. If bilateral or extensive, it may well prove fatal unless properly recognized and adequately treated.

A large rapidly recurrent pneumothorax following severe chest trauma, especially of the crushing type, should always raise the question of a ruptured bronchus as the cause of the picture. Prompt recognition of this situation with early thoracotomy and suture of the bronchial rent may save the function of the involved lung as well as relieve the source of pneumothorax.

Spontaneous pneumothorax runs a variable and quite unpredictable course. It apparently occurs more commonly in the younger individuals without clinical evidence of emphysema although it is occasionally seen in older individuals with marked emphysematous changes or large bullae. In the elderly, it may be much more serious because of associated cardiovascular disease or low respiratory reserve and may easily lead to fatal outcome unless promptly recognized and relieved. The individual attack may be mild or severe, the amount of collapse slight or extensive, and the duration of the leak, short or with continued leakage it may last for a considerable period of time. There may be some relationship to the "cold seasons" for we have repeatedly noted spring and fall "epidemics," with a number of patients with this condition appearing in a short period of time and then several months elapsing before another group appears. There is, however, no history of antecedent, respiratory infection in most of these patients.

There is a definite tendency for recurrence in spontaneous pneumothorax for about thirty percent of the patients who have sustained one attack may be expected to subsequently have another episode on the same or the opposite side. Attempts to precipitate a recurrence of collapse by very strenuous physical activity have in a few instances proved unavailing only to have a recurrent episode occur while sitting quietly in a chair some months afterwards. The uncertainties of the situation and the recurrent time loss with succeeding attacks can create a very distressing situation for these patients.

Treatment

The treatment of pneumothorax may be outlined as (1) conservative, (2) aspiration, single or multiple, (3) continuous decompression by means of an under the water break-over or continuous suction, and (4) surgery, resection of bleb, decortication and obliteration of the pleural cavity.

If the pneumothorax pocket is small, not increasing, and not distressing the patient particularly, the patient may be treated conservatively, allowing the air to absorb from the pleural cavity. This will occur at the rate of 50 to 75 cubic centimeters per day depending upon the normality of pleura and the patient's activities. The patient's activities are usually restricted at least for a few days at the onset. If the amount of the collapse is rather large, the duration of disability may be reduced somewhat by aspiration of air from the pleural cavity, instead of waiting for spontaneous absorption. It is usually advisable to wait for twenty-four to forty-eight hours before aspirating air as an elective procedure if the patient is having no real distress, thus giving the pleura time to seal the leak. Early aspiration or the creation of too high a negative pressure in the pleural cavity may perpetuate the leak. Likewise complete aspiration of all air from the pleural cavity may bring the expanding lung into contact with the tip of the aspirating needle, producing an accidental pneumothorax on top of the original spontaneous collapse.

The best site for air aspiration with the patient propped up slightly in dorsal recumbent position is the second anterior interspace in the mid clavicular line, if the lung is free of the chest wall in this area. If the pneumothorax is large, aspiration in several stages may be advisable for removal of most of the air at one sitting may give severe distress if the lung has been collapsed and atelectatic for a time and does not expand readily.

Tension pneumothorax demands prompt decompression if disastrous results are to be avoided. This is especially true in the patient with cardiovascular disease or a low vital capacity in whom delay in affording relief may well prove fatal. No elaborate apparatus is necessary for decompression of a tension pneumothorax. All one needs to do is to insert an number 18 gauge needle into the pleural cavity in the second interspace anteriorly. The pressure in some of these pockets may be sufficient to blow the plunger of the attached syringe across the room, decompressing the pocket considerably through the open needle. Additional air can be expressed through the needle by requesting the patient to strain or it may be aspirated with a

syringe. It must not be forgotten in dealing with tension pneumothorax that the condition tends to recur. Therefore the physician must either make provision for repeated needle aspiration, or better yet for continuous decompression of the pocket by catheter.

Another thing which must be remembered in these days of rapid transportation by land and by air is that Boyle's law has not been repealed and any closed pocket of gas under increasing altitude or diminishing barometric pressure as in a transcontinental trip or an airplane flight may become a tension pocket and demand prompt decompression. Continuous decompression is best accomplished by insertion of a blunt needle or cannula, a flat S shaped Clagett cannula, or better, a small rubber or plastic catheter into the pleural cavity, connecting it to some mechanism for intermittent or continuous removal of air.

The second interspace anteriorly in the midclavicular line is the site of choice if the lung is free at that point. A straight needle with a very blunt point is adequate for simple aspiration but is not suitable for continued decompression for it is difficult to maintain in proper position and the point although blunt can easily tear the surface of the expanding lung, creating an accidental pneumothorax. A straight blunt cannula eliminates the lung tearing danger but presents the other disadvantages of a straight needle. The flat S shaped Clagett cannula with its blunt tip and side ports near the tip is distinct improvement over the needle or straight cannula as its inner end lies parallel to the chest wall while its outer attachments lie parallel to the skin. The chief argument against it is that it gives considerable discomfort from pressure in the chest wall and the parietal pleura inside.

The best solution to this problem is the insertion of a small rubber or plastic catheter number 12 or 14 gauge. If it is rather soft and is inserted through a cannula directed slightly upwards through the second interspace for a couple of inches it will come to lie parallel to the surface of the expanding lung and be lifted up by it as it expands and will adequately empty the air pocket and not interfere with expansion of the lung. The catheter may then be connected by tube to an under the water break-over, placed well below the patient's body level with the end of the tube not over one centimeter under the surface of water. This will allow adequate escape of air decompressing any pocket to a pressure of one centimeter of water above atmospheric pressure. If the patient will then strain or cough, additional air will be forced out, the water seal preventing suction of air back into the chest through the tube.

A controlled negative pressure suction machine may also be attached to the catheter but care must be exercised to avoid too high a negative pressure or the leak may be reopened or perpetuated. The desirable setting is to have rather large output volume at a very low negative pressure of not over four or five centimeters of water. With such treatment, in the majority of patients the leak will cease and the lung expand to the chest wall rather rapidly. When the lung is well expanded and seems to stay out, the tube may be clamped off for twenty-four to forty-eight hours and then if there is no recurrence, may be removed from the pleural space. If there is fluid or blood to be removed from the pleural cavity this will not be accomplished through an anterior catheter. This must either be aspirated through a posterior site or a posterior basal catheter inserted to take care of it.

Most patients with spontaneous, traumatic or accidental pneumothorax will seal the leaks and expand the lung under such a program. There are, however, a few in the spontaneous group and a few in the traumatic group in whom larger leaks do not seal promptly, and continuous air leakage occurs. This is particularly true with rupture of a larger bleb or cyst in the lung or with rupture of a bronchus or in traumatic or spontaneous perforation of the esophagus. These patients demand prompt surgical intervention, suture of the leak or repair of the bronchus or esophagus if the patient is to be saved.

Recurrent Spontaneous Pneumothorax

Recurrence of spontaneous pneumothorax on the same or opposite side occurs in at least thirty percent of individuals, some on many occasions. If the patient is young and intelligent, he will recognize the recurrence promptly and place himself under a physician's care immediately. If he is a city dweller close to a hospital and medical care, the danger to life is probably quite small, for relief can probably be afforded quite promptly. If on the other hand he lives in a remote area or is a traveling salesman or has some other occupation which takes him into strange communities, or if he takes hunting or fishing trips to remote locations, an extensive recurrence away from home

could prove serious if not fatal. The same applies to an airplane pilot, to the passenger who travels much by air, to one who works in a hazardous occupation, or one in which he is responsible for the safety of many others, or where his sudden collapse may endanger himself or others. The time and economic loss and the repeated hospital expense from recurrent attacks must also be taken into consideration in determining whether surgical intervention should be recommended. It is not always the number of attacks which the patients have had but the individual circumstances involved in each particular case which should determine the treatment to be recommended.

Rarely do we operate for a first attack. However, in the case of the airplane pilot, or the man who lives or travels in out-of-the-way places and others in related categories, we would be inclined to recommend surgical intervention without delay. The same should be said also for the patient who has a progressive hemothorax with his pneumothorax. It must be remembered that neither spontaneous absorption nor expansion by aspiration or catheter drainage does anything to obliterate the pleural cavity or prevent recurrence.

Surgical attack in this condition has four primary functions: to control air leakage, to stop bleeding, to expand the lung, decorticating if necessary, and to obliterate the pleural cavity. The leaking area if still active may be easily identified during thoracotomy by expansion of the lung under water. The leak may be from a bleb of some size but frequently will be from a small marginal emphysematous bleb. Ligation or suture or excision of the leaking bleb will control the leak. The lung under bag pressure will then expand unless bound down by a fibrin membrane from fluid or blood which may be removed by decortication. Bleeding usually from the parietal side from a torn adhesion is easily controlled.

Obliteration of the pleural cavity may be accomplished in various ways. Twenty-five years ago poudrage with talc through cannulae under telescopic guidance was painful and produced at best an uneven and spotty obliteration of the pleural cavity. The obliteration which may follow blood or fluid following collapse may likewise be spotty or even entirely absent.

The injection of irritating substances such as hot water, hypertonic saline or glucose solutions, talcum powder, zephiran chloride, or others will irritate the pleura and obliterate the space upon expansion, but unless used in large amounts to cover all surfaces will not seal all areas of the pleural cavity. Theoretically, an irritating non-toxic gas should produce a complete pleural irritation and obliteration. Pleurectomy will certainly produce adhesions between the lung to the chest wall, but unless a complete parietal excision is done, there may still be unobliterated areas and recurrence of pneumothorax may still occur. (I have recently seen such a recurrence.) Practically, pleurectomy is not necessary in order to stick the lung to the chest wall. It adds unnecessary trauma to the surgery and increases blood loss, and more serious, it detroys the extra pleural layer which is the thoracic surgeon's friend. Should the patient subsequently require chest surgery on this same side, it will seriously increase the risk and difficulty of the procedure.

Our own preference at open thoracotomy includes excision of leaking area, complete abrasion of pleura both visceral and parietal with dry gauze and then complete inundation of the entire pleural cavity with 1-1000 aqueous zephiran chloride for two minutes followed by irrigation with saline and closure over two drainage catheters for suction.

Blood loss from this procedure has been small (under 250 cc.). Transfusion has been necessary in only seven of the last forty patients so treated. Four had low hemoglobin and were in poor general condition preoperatively and were given a single unit of blood. Three also required decortication and received replacement for blood lost in amounts of 500, 1000, and 2000 cc. There have been no recurrences of pneumothorax on the operated side in any patient treated by this method. One patient developed a spontaneous collapse on the contralateral side some six months following surgery and was operated upon and pleural obliteration carried out on the second side. Five other patients had a history of previous pneumothorax on both sides at different times in the past. Two of these had simultaneous bilateral collapse at the time of surgery, but only one pleural cavity was obliterated. Recovery was uneventful and there has been no recurrence on the opposite side. One patient who had had three attacks on the right and one on the left was operated upon for the recurrent right trouble during pregnancy. Recovery was uneventful.

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Abdomino-Presacral Resection for Selected Rectal Lesions

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THE FINAL status of sphincter saving operations for carcinoma of the rectum awaits further evaluation. Recent contributions[1,2] have enlarged upon previous knowledge[3,4] of the routes of lymphatic spread in rectal carcinoma. In lesions of the upper rectum, published results by surgeons experienced in sphincter preserving techniques compare favorably with those achieved by the Miles procedure.[5] This tends to confirm the belief that lateral spread of malignancies in this area may be of secondary importance because it is likely that wider excision at this level may be achieved by abdominoperineal resection. Thus it may be true that malignant lesions in the mid portion of the rectum can be eradicated with approximately the same chance of cure by either the Miles procedure or by one of the sphincter saving operations.

In spite of these reported favorable results of "pull through" types of operations, there remains reason for disagreement concerning the relative merit of these procedures. The desirability of a functioning sphincter is unquestioned, but the degree of control in some patients following the "pull through" operation is not satisfactory.[6] When satisfactory sphincter function is not retained, the patient is, in effect, left with a colestomy in an inconvenient location.

Failure of sphincter function has discouraged many from using the "pull through" procedure and the conventional abdominoperineal resection remains as probably the most commonly[7] accepted method of treating malignancies in this area.

It is not the purpose of this paper to attempt to compare the various procedures available for use in this location. Our preference is a one-stage abdominoperineal resection for carcinoma of the rectum, reserving anterior resection for those near or above the peritoneal reflection. Anterior resection for presacral lesions is possible, but it is technically difficult, it is attended by frequent complication, and it is not the procedure of choice. Occasionally one will be called upon to treat a lesion in which the Miles procedure would not be desirable, as in a bulky polyp of questionable malignancy.[8] Also there are instances in which preservation of sphincter control is mandatory, for example in an individual who has markedly restricted vision or who is completely blind, making adequate care of a colostomy almost impossible. Mentally deteriorated patients may also be in the category where sphincter preservation is a "must." Confronted with such a situation in a number of patients, a modification of the procedure described by Gordon Murray[9] has been used with satisfactory results. This operation, as originally described, consisted of trans-sacral excision of the rectum, with primary anastomosis, without diverting colostomy. To achieve wider dissection, this has been modified to include an abdominal stage, in addition to the trans-sacral excision.

Technique

Abdominal Stage.—Exploration is carried out through a left lower paramedian incision. The sigmoid, iliac and descending colon are mobilized. When performed for malignancy, an adequate amount of colon consistent with good cancer surgery is resected. The pelvic peritoneum is incised and the rectum dissected as in the Miles procedure. The amount of sigmoid to be included in the resection is placed below the pelvic peritoneum and the pelvic floor is reconstructed. The abdominal wound is then closed.

Perineal Stage.—The patient is placed in the inverted (jack-knife) position and a vertical incision is made from the dorsum of the sacrum to just above the anal margin. The coccyx, the fifth, and half of the fourth sacral bodies are removed after separating their muscular attachments. Entrance into the presacral space is thus achieved, and the bowel previously placed here is delivered through the sacral wound. Resection is performed and reconstruction done by anastomosing the proximal and distal segments. This anastomosis is done with an inner layer of chronic intestinal suture and an outer layer of interrupted silk sutures. Following

completion, a rubber rectal tube is passed through the anastomosis and sutured to the anal skin. The presacral space is drained and the wound closed.

Case Reports

The following cases are reported to illustrate lesions in which this procedure may be used to advantage.

Case 1.—R. T., a man aged thirty-two, was admitted to Minneapolis Veterans Hospital September, 1952. In 1950, he had an exploratory laparotomy at which time a perforation of the sigmoid colon was closed. This was followed by development of a stricture of the sigmoid and an external colonic fistula. In March, 1951, the fistula was excised along with resection of the sigmoid and removal of an ileal fistula. This was followed by a transverse colostomy necessitated by recurrence of colonic fistula. Resection of the sigmoid and recurrent fecal fistula and drainage of a pelvic abscess was performed again in September, 1951. In March, 1952, the sigmoid was again resected with anastomosis 15 cms. from the anal margin. This was followed by development of a pelvic hematoma and recurrence of the sigmoidocutaneous fistula. Examination on admission revealed a functioning transverse colostomy, a number of abdominal surgical scars and a fecal fistula in the lower abdomen. A rectal stricture at 8 cms. was demonstrated, and x-ray revealed residual barium present in the pelvis from previous studies. On September 9, 1952, a modified Gordon Murray procedure was performed. Approximately 15 cms. of colon, including the fistula, was resected and the anastomosis made just above the pectinate line. Postoperatively there was drainage from the presacral space but no fecal fistula was demonstrated. On October 10, 1952, the colostomy was closed. Following this, the patient had good sphincter control, but there was persistent drainage from the perineal incision. In March, 1953, a small fistula in ano extending from the lowermost part of the sacral incision to the pectinate line was excised. This healed rapidly and six months later the patient had a healed wound with normal sphincter control. Recent examination reveals his condition to have remained satisfactory.

Comment.—This patient presented a difficult problem because of six previous surgical procedures, residual colonic fistula and presacral abscesses. His age (thirty-two) and the absence of evidence of malignancy warranted efforts to preserve rectal function, and he was eventually restored to normal rectal continence. One can only conjecture as to the original pathology, but sigmoid diverticulitis probably is most likely.

Case 2.—G. S., a man aged fifty-seven, a duodenal ulcer patient, was found to have a rectal polyp at 10 cm., located on the anterior rectal wall. This sessile polyp with a base of 4 cm. was removed, and on section it was considered to be malignant. No other polyps were demonstrated. On December 31, 1952, a modified Gordon Murray procedure was performed, at which time 16 cms. of bowel was resected. Examination of the resected specimen failed to demonstrate residual tumor. Postoperatively, the sacral wound drained for four weeks, but no fecal fistula developed. This patient has been followed in the clinic and was last seen May, 1958, at which time he was doing well.

Comment.—Resection was elected in this patient because of the probable malignant characteristics of the polyp, although it appeared to have been removed completely. Possible extension through the rectal wall seemed to justify the procedure. As frequently happens, examination of the resected specimen failed to demonstrate residual malignancy.

Case 3.—S. B., a man aged eighty-three, was admitted May 5, 1954, with proven adenocarcinoma of the rectum at 8 cms. The patient had been under treatment for carcinoma of the prostate, and bony lesions in the pelvis and ribs were interpreted as probably prostatic in origin.

On May 18, 1954, a modified Gordon Murray procedure was performed. At operation a mass was encountered in the dome of the bladder. This was excised and a suprapubic cystostomy done. Microscopically this was thought to be metastasis from the rectal lesion. Postoperatively the patient developed a fecal fistula, noted on the twelfth postoperative day. Because of poor general condition a colostomy was not done, and the fistual filled in gradually, finally healing in two months.

Comment.—Trans-sacral resection was elected in this elderly patient because of the presence of a second carcinoma with metastases. This man would undoubtedly have been benefitted by a colostomy, but the fistula eventually healed. The patient died one year postoperatively.

Case 4.—S. T., a man aged sixty-five, was admitted to Minneapolis Veterans Hospital January 16, 1954, for treatment of carcinoma of the rectum at 6 cms., proven by biopsy. The patient was confused, disoriented, totally incompetent and incontinent and had been under treatment for arteriosclerotic cardiovascular disease with fibrillation, and cerebral arteriosclerosis. Examination revealed a disoriented, senile, compensated cardiac patient with auricular fibrillation. No distant metastases were demonstrated.

On February 3, 1954, a modified Gordon Murray procedure was performed. The submitted specimen revealed adenocarcinoma of the rectum with metastases to the lymph nodes. Postoperatively the patient developed atelectasis and had drainage from the upper margin of the posterior wound, but no fecal fistula was demonstrated. Following operation, the mental condition improved slightly and the patient was continent of feces.

The patient was transferred to a mental hospital for further care. Follow-up indicates that he died one year later of arteriosclerotic heart disease. Autopsy failed to show recurrent tumor.

Comment.—Because of the mental deterioration of this patient, it seemed advisable to attempt a resection that would preserve sphincter function. Difficulty in colostomy care contraindicated the Miles procedure.

Discussion

In Gordon Murray's original report of fifteen cases, five were followed by fecal fistula although all maintained good sphincter control with eventual healing of the fistula. In no case did he feel justified in performing a diverting colostomy.

In this present group, fecal fistula occurred in two patients, one in whom a colostomy existed prior to the procedure. Colostomy was considered for the second patient, but this was not done. Experience with this limited group suggests that a diverting colostomy probably should be done in most instances.

The original procedure has been modified to include an abdominal stage in order to achieve more adequate, wider resection. Neither the original nor the modified operation is the procedure of choice in the majority of rectal lesions but is cited as a useful tool in very selected patients.

Summary

1. A modification of the procedure described by Gordon Murray is described.

2. Four illustrative cases are cited.

3. This procedure is useful in selected cases where retention of sphincter control is mandatory.

4. The abdominopresacral resection here described is not intended to replace more conventional methods in the usual patient.

References

1. Best, R. R., and Rasmussen, J. A.: Sphincter preserving operation for carcinoma of the rectum. Arch. Surg., 72:948, 1956.
2. Baron, H. E., and Sherman, L. F.: Carcinoma of the colon and rectum. Factors influencing greater curability. J. M. A., Alabama, 19:310, 1950.
3. Gilchrist, R. K., and David, V. C.: A consideration of pathological factors influencing five year survival in radial resection of the large bowel and rectum for carcinoma. Ann. Surg., 126:421, 1947.
4. de Peyster, F. A., and Gilchrist, R. K.: Pathology of carcinoma of the colon and rectum. Classification of modes of spread. Surg. Clin. N. A., 35:1295, 1955.
5. Waugh, J. M., Block, M. A., and Gage, R. P.: Three and five year survival following combined abdominoperineal resection, abdominoperineal resection with sphincter preservation and anterior resection for carcinoma of the rectum and lower sigmoid. Ann. Surg., 142:752, 1955.
6. Sommers, H. M., and Maddock, W. G.: The treatment of carcinoma of the mid rectum with preservation of the sphincters. S. Clin. N. W., 34:231, 1954.
7. Baker, J. W., Margetts, L. H., and Schutt, R. P.: The distal and proximal margin of resection in carcinoma of the pelvic colon and rectum. Ann. Surg., 141:692, 1955.
8. Buchwalter, J. W., Shropshire, R., and Joiner, B. A.: Morbidity of abdominoperineal resection. S. G. O., 101:483, 1955.
9. Murray, Gordon: Resection of the rectum with reconstruction of canal through the perineal approach. S. G. O., Abst., 82:283, 1946.

Discussion

Dr. R. J. Tenner: I enjoyed Dr. Utendorfer's presentation very much and agree with him that the combined abdominal perineal resection always raises the two problems of urinary and sexual complications. By preserving the sphincter muscle as in the Gordon Murray procedure, many of the sex and urinary complications can be avoided. In view of the increase in the younger group with carcinoma of the rectum, this is a real and important consideration.

Dr. Howard M. Frykman: I have had no personal experience with this particular procedure, but I would think that it might have a definite place in obese patients, with lesions at the recto-sigmoid or upper rectum. In these individuals, a low end-to-end anastomosis done through the abdomen is extremely difficult technically because of the obesity. It also might be used in palliative procedures done for adenocarcinoma of the rectum in which hepatic or other distant metastases are present. When there is no hope of cure because of inoperable metastases, one hesitates to establish a permanent colostomy if it is technically feasible to avoid it. With the high incidence of postoperative perineal fistulas, however, one might be reluctant to attempt this procedure. Even though many of these perineal fecal fistulas heal spontaneously in time, it is a distressing complication to both the patient and the surgeon when it does occur.

Dr. L. F. Sherman: Use various procedures selectively: (1) Group of old patients, and those with mental aberrations where sphincter control is very important because patient cannot care for colostomy; (2) Below the middle valve of Houston the occasional operator should stick to combined abdominal perineal procedure; (3) Selected early lesions (carcinomas) without local extension above the middle valve of Houston (7-8 cm.) to 12 to 14 cm. are ideal for resection by "pull-through" procedures, whether by the classical Bacon-Babcock procedure or the Swenson perineal anastomosis depends upon the operators experience.

Dr. R. W. Utendorfer (closing): I should like to thank the discussants for their comments. I am certain that we all agree that the Gordon Murray procedure or its modification has only limited application. It is cited here as useful in certain selected instances and has been a satisfactory procedure when performed for these indications.

Intrapleural Use of Nitrogen Mustard in Malignant Pleural Effusion

Excessive accumulation of pleural fluid is a troublesome accompaniment of malignant tumors of the lungs and pleural surfaces. This paper describes the intrapleural instillation of nitrogen mustard for controlling such effusion. Two-thirds of a group of 28 patients received benefit from this treatment.

PLEURAL effusion frequently is associated with malignant tumors involving the lungs and pleural surfaces. Occasionally, such an effusion remains small and relatively asymptomatic for comparatively long periods. Usually, however, it is a problem of major symptomatic importance to the patient. Dyspnea, cough, thoracic discomfort and pain associated with thoracentesis may be the only symptoms of the malignant lesion in these cases. Thus, efforts to control such effusions are well directed.

Treatment usually has consisted of removal of fluid when necessary to control symptoms or irradiation of the hemithorax. When radiogold (Au^{198}) became available for intrapleural use, it represented a decided improvement in therapy. However, the cost of administering Au^{198}, in addition to the radiation hazard attending its use, made it desirable to find a different agent that might be equally effective.

In 1948, Karnofsky and associates[1] first reported the intrapleural administration of nitrogen mustard (methyl-bis [β-chloroethyl] amine hydrochloride). Since then, others[2-4] have documented its use. Bonte and co-workers[5] obtained satisfactory control of pleural effusion with nitrogen mustard in 66 per cent of their patients, which equaled their success with Au^{198}.

We wish to present the results obtained with the intrapleural administration of nitrogen mustard at the Mayo Clinic.

Methods

Patients included in this study had malignant cells in the pleural fluid plus a clinical history suggesting a malignant tumor or had a proved malignant tumor with associated pleural effusion for which no other cause was demonstrated. Whenever possible, use of nitrogen mustard was delayed until some knowledge was gained as to the rapidity with which fluid was forming. If treatment was to be instituted, leukocyte and platelet counts were checked, after which thoracentesis was done in the usual manner, utilizing a three-way stopcock and removing as much fluid as could be done easily. Sufficient fluid for purposes of dilution was allowed to remain. Through the stopcock, a freshly prepared solution of nitro-

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TABLE I. CAUSE OF PLEURAL EFFUSION IN FIFTY-FIVE PATIENTS GIVEN NITROGEN MUSTARD INTRAPLEURALLY

Site of Primary Tumor	Cases	Per Cent
Breast	27	49
Lung	8	14
Lymphoma	7	13
Ovary	2	4
Miscellaneous	11	20

gen mustard was injected after it was determined that the tip of the aspirating needle was still in the pleural space. The dose was 0.4 mg. per kilogram of body weight. The patient was instructed to change position frequently during the following hour in an effort to expose as much of the pleural surface as possible to the action of the nitrogen mustard. When it became obvious that the patients usually experienced nausea after this procedure, chlorpromazine or a related drug was given just before thoracentesis.

TABLE II. EFFUSION DUE TO MALIGNANT DISEASE IN FIFTY-FIVE CASES: RESULTS OF INTRAPLEURAL USE OF NITROGEN MUSTARD

Not acceptable for study		27
Inadequate data	17	
Significant concomitant therapy	10	
Acceptable for study		28
No value	9	
Probable value	7	
Definite value	12	

If pleural fluid rapidly reaccumulated, thoracentesis was repeated twenty-four to forty-eight hours later. This reaccumulation presumably resulted from pleural irritation produced by the nitrogen mustard. Otherwise, thoracentesis was not done routinely after treatment. In a number of instances, roentgenograms of the thorax made one or two days after treatment suggested that considerable pleural fluid was present. However, appropriate roentgenograms made with the patient in the lateral decubitus position frequently demonstrated that this density represented primarily a pleural reaction or loculated fluid. Thoracentesis yielded little fluid in such instances.

Results

A total of fifty-five patients was treated in the manner just described. This group included thirty-nine females and sixteen males. The primary malignant tumors encountered are listed in Table I. Carcinoma of the breast accounted for almost 50 per cent of the total.

It is difficult to evaluate this form of treatment. Three categories of patients were eliminated from the study (Table II). Because the rate of formation of pleural fluid varies greatly in different patients, it was required that the history contain sufficient data to allow us to estimate accurately how rapidly fluid was forming; in the absence of such data, the patient was excluded from the study on the basis that we had no pretreatment information with which to compare posttreatment results. Merely determining how often thoracentesis was necessary after treatment was not considered adequate grounds for estimating the efficacy of treatment. Thus, six patients were excluded because of insufficient pretreatment data. Patients living less than one month after treatment constituted the second category excluded from the study; there were eight such patients. Three additional patients were lost to follow-up. Thus, seventeen patients were excluded because

of insufficient data. The third category consisted of ten patients who were omitted from this study because other forms of treatment, such as the use of hormones or radiation, that might have been a factor in the control of fluid had been used simultaneously. Most of these patients had carcinoma of the breast.

A total of twenty-eight patients remained for study (Table II). In twelve (43 per cent), the instillation of nitrogen mustard into the pleural space was of definite value. These patients either did not require thoracentesis for significant periods or the number was reduced significantly. An additional seven patients (25 per cent) probably received benefit. In these patients, fluid still re-formed but at a slower rate, or the benefit was of short duration. The remaining nine patients (32 per cent) did not receive any benefit. When only patients with carcinoma of the breast were considered, the results were similar. Three patients received more than one dose of nitrogen mustard. In one, the first treatment was not successful whereas the second one was; in the second patient, both administrations of nitrogen mustard were definitely beneficial; in the third patient, the first treatment was of a definite benefit but the second and third treatments were without benefit. None of the small group of patients with lymphoma were benefited.

Usually, the patient experienced nausea and vomiting within one hour and a pleuritic type of pain for one to three days after the injection. Hematologic complications were not encountered when the standard dose of 0.4 mg. per kilogram of body weight was used.

Comment

The results thus far have approximated those obtained previously at the clinic[6] with Au^{198} in the control of malignant pleural effusion, and they have encouraged us to continue use of nitrogen mustard in place of this agent.

The method by which nitrogen mustard accomplishes control of effusion is not altogether clear. Presumably, its cancerocidal action is important. However, it also produces chemical pleuritis that may alter the pleural surface in such a way as to reduce the formation of fluid or may lead to adhesive pleuritis that precludes the re-formation of pleural fluid. It is on such a basis that Chambers[7] has used with success a noncancerocidal but irritating agent such as talc in the pleural space to prevent recurrence of pleural effusion. We have chosen to continue using nitrogen mustard because it does have cancerocidal properties and because it has not caused significant complications, but we emphasize its potential for producing obliterative pleuritis. For this reason, as already indicated, we now remove as much pleural fluid as possible twenty-four hours after the instillation of nitrogen mustard unless free fluid is not evident. In those patients who form large amounts of pleural fluid, we have been utilizing an intercostal catheter to drain the pleural space, instilling the nitrogen mustard and, after twenty-four hours, reapplying constant suction until the pleural space is empty, as described by Taylor.[8] This procedure has the disadvantage of requiring the patient to be in the hospital for a longer period.

Summary

A group of twenty-eight disabled patients with pleural effusion caused by malignant tumors were treated by the intrapleural instillation of nitrogen mustard. A total of 43 per cent were definitely benefited, 25 per cent probably were benefited, and 32 per cent were not helped.

References

1. Karnofsky, D. A., Abelmann, W. H., Craver, L. F., and Burchenal, J. H.: The use of the nitrogen mustards in the palliative treatment of carcinoma: With particular reference to bronchogenic carcinoma. Cancer, 1:634 (Nov.) 1948.
2. Albertelli, Jorge, Mónaco, Horacio, O'Connor, Tomás, and Bur, G. E.: Mostaza nitrogenada por via arterial en el tratamiento del cancer pelviano. Prensa méd. argent., 40:2085 (Aug. 7) 1953.
3. Fullerton, C. W., and Reed, P. I.: Nitrogen mustard in treatment of pleural and peritoneal effusions. Canad. M. A. J., 79:190 (Aug. 1) 1958.
4. Grady, E. D.: Instillation of nitrogen mustard in body cavities for treatment of metastatic cancer. J. M. A. Georgia, 48:267 (June) 1959.
5. Bonte, F. J., Storaasli, J. P., and Weisberger, A. S.: The treatment of carcinomatous effusions in serous cavities. Mississippi Valley M. J., 79:286 (Nov.) 1957.
6. Colby, M. Y., Jr.: Intracavitary radioactive colloidal gold in the treatment of malignant pleural effusion. M. Clin. North America, 38:1133 (July) 1954.
7. Chambers, J. S.: Palliative treatment of neoplastic pleural effusion with intercostal intubation and talc installation. West. J. Surg., 66:26 (Jan.-Feb.) 1958.
8. Taylor, Lawrence: A technique for intrapleural administration of nitrogen mustard compounds. Am. J. M. Sc., 233:538 (May) 1957.

Soft Tissue Injuries of the Hand

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THERE ARE several fundamental principles that must be followed in the treatment of hand injuries.[1]

First of all—the history of the wound, including the time, type of instrument causing the wound, and the nature and extent of first treatment, must be determined accurately. The open wound and injured tissues must be protected from further injury and from secondary contamination. An accurate determination of the extent of injury must be made. All devitalized tissue should be excised by sharp dissection in a methodical manner in order to transform the open wound into a surgically clean wound. One should use good judgment in debridement and be particularly conservative in debriding the skin. All exposed vulnerable structures such as tendons, nerves, joints, and bones should be closed over and the wound as a whole closed.

The causes and prevention of crippling of the hand should be uppermost in one's mind when attempting treatment. The common types of crippling seen as a result of hand injuries have been thoroughly reviewed by Bunnell[2]: stiffening in the position of non-function, flexion contractures, skeletal malalignment, and trophic disorders.

Stiffening in the position of non-function with loss of opposition of the digits is due to three main factors: swelling, immobilization, and allowing the hand to remain in the position of non-function. When the hand is immobilized, only the injured digits should be immobilized. The position of function is well known, but it bears repeating: the wrist is dorsiflexed about 30°, the finger joints are in moderate flexion, the metacarpals form an arch, and the thumb is in moderate opposition. In this position the tips of the fingers all point toward the carpalnavicular; this point should always be kept in mind when splinting a finger or fingers. The wrist is the key joint of the hand and the proximal finger joints are the key joints of the fingers. When the wrist is dorsiflexed, the hand assumes the position of function; when the metacarpophalangeal joints are flexed, the fingers "unclaw." The position of nonfunction is preventable by proper immobilization of these two joints. If the fingers must be immobilized they should not be in extension or in forced flexion.

Flexion contractures are the common sequelae of wounds, infections, and burns. The infected open wound is the most common cause of flexion contractures.

Skeletal malalignment from either malunion of fractures or unreduced dislocations disturbs the finely balanced function of the muscles, joints, and tendons of the hand.

Vasomotor dystrophies—such as Sudek's atrophy or causalgia—may result in lowered nutrition, pain, lessened motion, and fixation in poor position.

Initial Treatment of Open Injuries

On preliminary inspection, the location, extent, state of cleanliness, and type of wound are noted. A sterile dressing is applied and physical examination for bone, nerve, and tendon injury is performed, thus a clinical diagnosis is made before the patient is sent for x-ray or to the operating room. If antibiotics or tetanus toxoid (or antitoxin) are indicated, they may be given at this time.[3] We do not use prophylactic antibiotics routinely.

Definitive Treatment of Open Injuries

The initial preparation is done in the operating room with the use of either brachial block or general anesthesia. The hand and forearm are shaved; thorough cleaning for at least ten minutes is done with a detergent while a sponge is held over the wounds to minimize contamination. The wounds are not scrubbed with a brush or inundated with alcoholic solutions. Copious saline irrigation is carried out throughout the preparation. If there is contamination with grease, preliminary cleansing of the hand with ether may be necessary.

A good tourniquet is an absolute necessity. The area is then approached through the laceration. If necessary, the lacerations are extended for adequate exposure, being careful of crossing skin creases. The area is debrided by sharp dissection, saving as much skin as possible. Nerves are not debrided, as a general rule.

Following debridement, the extent of the wound is evaluated and the plan of repair determined. On rare occasions where adequate debridement cannot be done or the hand is badly traumatized and contaminated, the wounds may be packed lightly with fine mesh gauze and a secondary closure performed within ten days.[4] Generally, a primary closure may be done within twenty-four hours in a relatively clean, incised wound and within twelve hours, in a crushed wound in which adequate debridement can be done. If there is skin loss, the area should be closed with a split-thickness skin graft, if at all possible.

Tendon Injuries

In general, if the skin can be closed and the wound is clean, and not over four hours old, primary tendon suture (using 0000 silk or a pull-out wire) may be done by the experienced operator with adequate facilities and assistance. If the viability of the skin is questionable or if the hand cannot be mobilized in three weeks, delayed suture or a tendon graft should be used. A lacerated tendon adjacent to a fractured bone would not be sutured primarily, because it will very likely become adherent. To date, the results of primary repair are not significantly better than delayed repair, even in the most experienced hands. It is not worth while performing a primary repair if there is any question, whatsoever, of the tendon becoming adherent.

Flexor Tendons

The end results in repair of flexor tendon injuries, particularly within the osseofibrous tunnel of the fingers, still presents a rather unhappy picture. Flynn[5] presented the results of 401 tendon injuries seen over a two-year period in 1953; 51 per cent (of eighty-nine cases) showed poor results in repair of flexor tendons within the sheath and 32 per cent (of forty-one cases) gave poor results in repair of the extensors within the fingers.

The simplest method of suture is a double right-angled 0000 silk suture;[4] a pull-out wire and fine silk approximating sutures may also be used.

If the profundus tendon is lacerated beyond the insertion of the sublimis tendon, one may perform a primary repair if conditions are ideal. The profundus may be advanced and sutured to the bone or to the stump of the tendon distal to the distal interphalangeal joint. If the profundus is lacerated at the decusation of the sublimis tendon a primary interphalangeal tenodesis or secondary interphalangeal arthrodesis may be performed. If both sublimis and profundus tendons are lacerated in "No Man's Land" (proximal finger crease to distal palmar flexion crease), a secondary graft or reconstruction should be done. If the sublimis tendon alone is lacerated within the sheath, no repair is needed because early motion will maintain profundus excursion and satisfactory function will be obtained. When the sublimis tendon is lacerated in the palm, no repair is indicated. The treatment of laceration of both the sublimis and profundus tendons in the palm will depend upon the position of the fingers at the time of injury.[6] If the finger was in flexion at the time of injury, a secondary graft is performed since the juncture of the tendon ends, with the finger in the functional position, would be within the flexor sheath distal to the metacarpophalangeal joint. If the finger was in extension at the time of injury, the juncture of the tendon ends will lie in the middle of the palm with the fingers in the position of function; therefore the profundus alone is repaired.

Extensor Tendon Injuries

One of the most common injuries about the distal portion of the extensor tendon of the finger is the so-called mallet finger. This is usually a closed injury resulting from avulsion of the conjoined tendon from the base of the distal phalanx of this finger. We prefer to treat these by closed means with a cast or splint; on occasion, particularly with undependable patients, one may use a Kirschner wire for fixation. The finger must be held with the distal interphalangeal joint in hyperextension and the middle interphalangeal joint flexed.

A laceration in the region of the proximal interphalangeal joint of the finger usually results in severance of the central extensor slip and displacement of the lateral bands. This type of injury results in the so-called boutonniere deformity with flexion of the proximal interphalangeal joint and extension of the distal interphalangeal joint because of volar displacement of the lateral bands and retraction of the central extensor slip. One must repair the central extensor slip and may need to approximate the lateral bands.

Laceration of the extensor tendon about the proximal phalanx results in flexion deformity of all the phalanges. The extensor hood and all the

extensor apparatus, including the intrinsic muscle insertions, should be repaired. This is a very serious injury and frequently results in considerable disability even though repair is performed.

When the long extensors of the fingers are lacerated over the dorsum of the hand there is very little retraction and suture is very simple. These tendons interdigitate so freely over the dorsum of the hand that they can be approximated readily by dorsiflexion of the wrist; one need use only fine approximating sutures and a splint for treatment of this injury.

The Thumb

The long flexor of the thumb has no vinculae and no lumbricale muscle; threfore, retraction will be great following a laceration. This construction offers one advantage in that the tendon can be lengthened easily from a point far proximal to the laceration. If the long flexor is lacerated in its distal portion, it may be advanced and sutured. Repair at the level of the metacarpophalangeal joint and proximal phalanx should be avoided since this is the constricted area of the sheath near the sesamoids; if the tendon is lacerated at this level, it should be lengthened at the wrist or advanced and sutured.

Repair of lacerations in the thenar area is particularly hazardous because of the danger to the important motor branches of the median nerve. When the nerve is intact, a secondary repair using a graft should be performed. If the tendon and nerve are lacerated, both should be repaired.

The long extensor of the thumb retracts considerably when cut, but it can be repaired primarily or secondarily without too much difficulty. The abductor pollicis longus is also easily repaired; it is important that this tendon be repaired because it is a stabilizer of the carpo-metacarpal joint of the thumb.

Postoperative Care of Tendon Injuries

The hand should be splinted as close to the functional position as possible; firm and even pressure should be maintained.

After repair of flexor tendon injuries, the hand is splinted with the wrist in about 45° palmar flexion and the fingers in mild flexion for three weeks; at the end of that time the splint may be removed twice a day for soaks and mild active exercises. After the fourth week, the splint is discarded entirely and exercise is continued.

In extensor tendon injuries, the hand is immobilized with the wrist in about 30° dorsiflexion and the fingers in mild flexion; the fingers are not splinted in full extension at any time. Extensor tendon repairs are immobilized four to five weeks.

Nerve Injuries

The injured nerves should be identified and sutured if possible. If the nerve cannot be sutured it should be tagged with fine wire and a secondary graft performed. Sutures of 00000 silk through the epineurium are used for approximation and the nerve should not be sutured under tension. It is a worthwhile effort to locate and suture the digital nerves out to, or even beyond, the proximal interphalangeal joint.

Injury to the Skin

If there is any question as to the viability of the skin, the tourniquet test may be used: Upon release of the tourniquet, that skin which does not show a marked blush, but remains white or cyanotic, should be excised. It is advisable to resect skin that is questionable rather than to try to salvage portions that have no blood supply. These areas should be covered immediately, if possible, with split-thickness skin grafts. If there is extensive skin loss, particularly over the palm or dorsum of the hand, a pedicle graft may be required.

Fingertip Amputations

Generally, we make every effort to maintain as much length as possible in the thumb and index fingers. If the bone is not exposed at the tip, one may cover it with a split-thickness skin graft. When the bone is exposed, one should use a full-thickness skin graft. It is difficult to maintain pressure over the end of a finger; this can be attained by leaving the sutures long and tying them over a piece of moist dental cotton. Nerves should be excised so that they retract well away from the site of amputation. Tendons should not be sutured over the end of the bone at any time. It must be remembered that grafting of finger tips prolongs the healing time; in the elderly patient or heavy laborer, shortening of the finger by plastic amputation, leaving the scar on the dorsum of the finger with a long volar flap may give quicker wound healing.[7] This type of repair also results in more normal sensation at the end of the finger and the tough volar skin withstands trauma better than a graft.

(References are on Page 400)

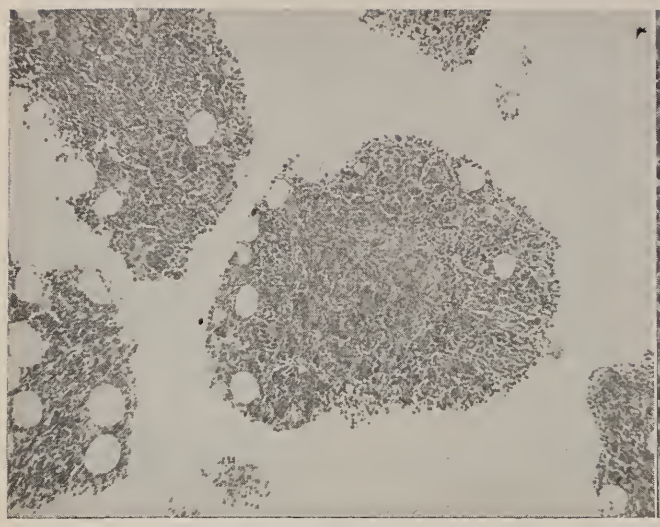


Fig. 1. Hyperplastic bone marrow units from a patient with Hodgkin's disease. The dense syncytial reticulum is evident in the central portion of the unit. Lesser involvement is seen in the units to the left.

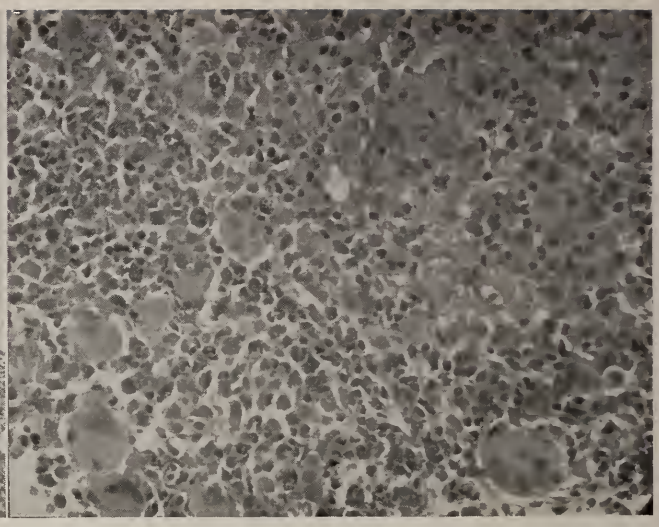


Fig. 2. Margin of a syncytial mass of reticulum showing the hyperplasia of megakaryocytes, eosinophils, and lymphocytes (*lower left*) leading into the tumor (*upper right*).

Diagnosis of Hodgkin's Disease

By Bone Marrow Aspiration

The section method of bone marrow study in contrast to the usual smear technique provides a higher percentage of positive results in the diagnosis of Hodgkin's disease. When the method of Dr. Emil Schleicher is used, it makes the tissue easier for the pathologist to identify and study.

THE DIAGNOSIS of Hodgkin's disease is usually suspected from the clinical picture including among other things weakness, fatigue, weight loss, fever, enlarging lymph nodes, splenomegaly, hepatomegaly and anemia. The suspicion is confirmed by removal and study of an enlarged lymph node which shows the typical pattern of Hodgkin's disease. In a number of instances, however, this procedure is not adequate to completely evaluate the case and to establish the best therapeutic regime. First, peripheral easily accessible nodes may not be enlarged and only thoracic or abdominal surgery could yield the necessary pathologic pattern for the diagnosis. Second, there may be a question of extent of the disease beyond a single group of nodes and again more extensive surgery needed to evaluate the problem in individual cases. Third, a vague symptom complex may not suggest Hodgkin's disease but the over-all process may be one of systemic non-specific disease. In such instances as these, bone marrow biopsy is recommended as a relatively easy method of gaining much needed information in diagnosis, classification, treatment, and prognostication of problem patients.

Review of the literature reveals an interesting divergence of opinion concerning the value of bone marrow study in Hodgkin's disease. Wintrobe[1] in his clinical hematology text states that the chief value of bone marrow in conditions affecting lymph nodes is to rule out leukemia especially the aleukemic form. The most constant

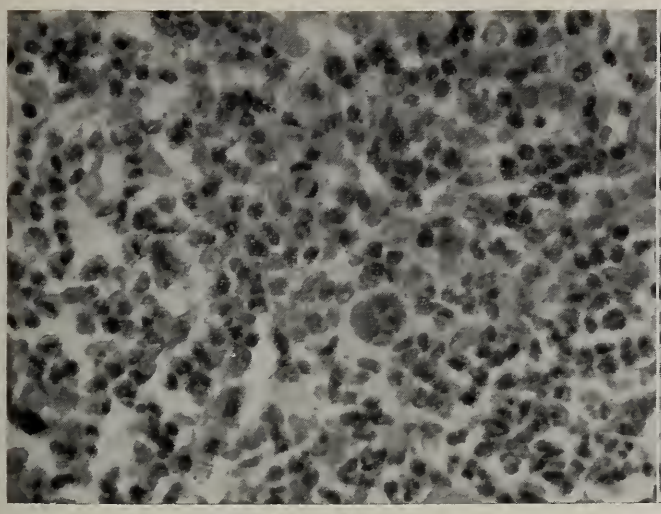


Fig. 3. Large multinucleated malignant reticulum cell typical of a Reed-Sternberg cell in a hyperplastic unit with eosinophils, lymphocytes, and reticulum cells, one of which is in mitosis.

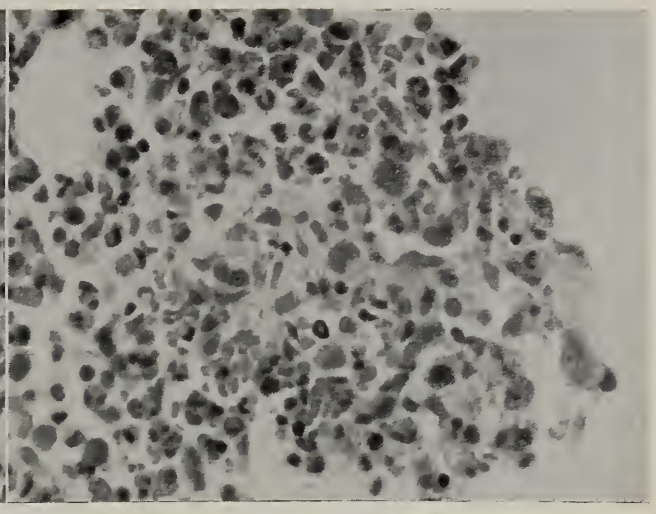


Fig. 4. Early reticulum change to malignancy (*large cells in center*). The early proliferation has nonetheless stimulated a hyperplastic reaction of eosinophils (*upper center*).

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feature in Hodgkin's disease according to the same author is myeloid and megakaryocytic hyperplasia. There may be a slight left shift of myeloid series or slight monocytosis or eosinophilia. Megakaryocytes may show immaturity and "naked" nuclei. A number of authors concur in this belief[2] that only a non-specific picture exists in this disease. Limarzi[3] especially influenced this field with a large series of cases without definite bone marrow changes.

A few authors,[2,4,5] report cases in which Reed-Sternberg cells were identified in the marrow. Sunberg[4] reported one patient on whom granulomatous lesions were seen in bone marrow sections but only after an "extremely diligent search" was a single Reed-Sternberg cell found in smear preparations.

The incidence of bone lesions in reported series is highly variable depending on the method of study. If only clinical evidence is used, an incidence of 8.3 per cent is reported by Steiner,[6] but systemic examinations at autopsy have revealed bone lesions in 50 per cent. Ewing[10] states that it is rare that a thorough search at autopsy fails to disclose some deposit in bone marrow. Steiner[6] studied easily accessible bones in fourteen cases of Hodgkin's disease and found lesions in 78.6 per cent, the sternal marrow containing lesions in 63 per cent of his fourteen cases. The same author states that there is no basis for the impression that skeletal lesions occur as a late manifestation of Hodgkin's disease.

The histological pattern of Hodgkin's disease

varies widely in different cases and even varies in multiple nodes from a given case. Bell[7] lists the following as features considered distinctive of Hodgkin's disease: increase in number and size of reticulum cells, giant cells of the Reed-Sternberg type, areas of fibrosis, obliteration of the sinusoids, eosinophilic leukocytes, and sometimes areas of necrosis. The essential feature is the overgrowth of reticulum cells with crowding out of the lymphocytes usually with some cells typical of the Reed-Sternberg type. Distinction into three types has been advocated in some areas.[8] The granulomatous type is the usual most commonly recognized form. The paragranulomatous lesion is a relatively benign type seen in about 10 per cent of cases and a "true neoplasm" of the sarcoma type is a more malignant form. All three blend together to a certain degree in a given case and all have Reed-Sternberg cells. The tendency of the three to intermingle tends to de-emphasize the value of this division, but Jackson and Parker[8] insist that any description including all three as a single form is inaccurate and of little value, so I have mentioned their classification and now I hope I have met their requirements and may again speak of the over-all picture of Hodgkin's disease without hurting their feelings or my own.

Because of the success of the section method of bone marrow study as described and refined by Doctor Emil Schleicher,[9] it seemed that a number of cases studied showed definite evidence of Hodgkin's disease in our bone marrow material. This study was, therefore, undertaken to demonstrate the value of such type of marrow study. It would appear that comparison of the bone marrow smear material with that of the unit in section shows that the hyperplastic reticulum does not easily separate out of the unit, and, therefore, is not free to be smeared out as are the developing myeloid and erythroid series or other free flowing cells of the bone marrow. The methods of aspiration, separation of units, preparation and staining have all been well documented and do not need repetition here.[9]

All cases were taken from the Tumor Registry of St. Barnabas Hospital from the years 1953 to November 1958 and include only those cases in which Hodgkin's disease was diagnosed or seemed a likely possibility.

Thirty-one such cases were found in our Registry. Of these thirty-one, two were patients with vague central nervous system symptoms whose bone marrow showed reticular hyperplasia of a type suggesting Hodgkin's disease. Neither of these have had node biopsies or any further study suggesting Hodgkin's disease and are not used. Three cases had the symptom complex suggesting reticuloma, all three had bone marrows with reticular hyperplasia but not diagnostic Reed-Sternberg cells. Because these three are lost without follow-up, node biopsies, or clinical course, they are also not considered in our series.

Twenty-six cases remain which are proven Hodgkin's disease by lymph node biopsy, major surgical specimen, or autopsy. Of these, twenty-two had bone marrow aspiration performed in the course of their diagnostic work-up. Fifteen of the twenty-two showed changes in the sections compatible with Hodgkin's disease, four had changes considered to be probable Hodgkin's disease; that is, reticular hyperplasia, eosinophilia, fibrosis, et cetera. Three cases showed no changes of Hodgkin's disease.

The dominant histologic change in Hodgkin's disease is a pathologic activation of the reticular cells of the reticulo-endothelial system. It is reasonable to expect that a tissue as rich in reticulo-endothelial tissue as the bone marrow would be commonly involved in this disease. If the bone marrow unit is studied in paraffin sections as are all other pathologic materials, the true pattern can be identified by characteristics we have learned to recognize in other tissue studies. Criteria for the diagnosis of Hodgkin's disease in a lymph node, spleen, or other organ then can be transferred to the bone marrow and familiar pathologic landmarks may be seen in their true perspective. Thus the anatomical pathologist need not feel off base or on unfirm ground when looking at bone marrow section material, as he may well be when looking at bone marrow smears, stained differently and with no relationship from one cell to the next.

The material presented in this report, of course, covers a wide range of the disease spectrum known as Hodgkin's disease. The custom of medical practice is to diagnose Hodgkin's disease by biopsy of lymph node and this series is no exception, since all cases were diagnosed by this means. The typical criteria previously mentioned were present in varying degrees and in varying stages. The bone marrow study in these cases was done in the same year in eleven cases and more than a year after the node biopsy in eleven cases.

The bone marrow changes include the changes

previously outlined but center mainly for diagnostic purposes about the hyperplastic reticulum cells. Photomicrograph number one shows a typical low power view of the hyperplastic marrow surrounding a nodule of dense cellular proliferation which even at this magnification has malignant characteristics.

A closer look at the nodular process (photomicrograph number two) shows a number of malignant reticular cells. Note the closely packed syncytial nature of the reticulum with Reed-Sternberg cells and scattered lymphocytes and eosinophils caught in their mesh. It is not difficult to see why cells such as these do not break free in smear preparations. Photomicrograph number three shows a typical Reed-Sternberg cell with its large multilobulated or indented nucleus, a definite chromatin net and prominent nucleolus. The abundant cytoplasm may be granular, flaky, or amorphous.

In less involved areas, the involvement of the marrow may be by other cells not of diagnostic character but usually altered by the disease process. Lymphocytes and eosinophils have already been mentioned as increased in number. Correspondingly there may be megakaryocytic hyperplasia as a prominent feature. These cells, though large, are distinguished from Reed-Sternberg cells by clumping of chromatin in a small nucleus with no nucleolus. The cytoplasm varies with the stage but should not be confused with Reed-Sternberg cells.

Normoblastic hyperplasia takes place early in bone marrow irritation and later as the marrow is crowded out the remnants of normoblasts may be seen in small clusters. Similarly, plasma cells may increase usually as an increased perivascular cuff.

The last photomicrograph, number four, shows an area of early minimal malignancy in bone marrow. Only a few abnormal cells are seen here without characteristics of Reed-Sternberg cells but definitely abnormal reticulum suggesting changes toward this specific cell type.

From the above material, it appears that Hodgkin's disease can be diagnosed from bone marrow material. An attempt has been made to show that all portions of the marrow take part in the irritation and stimulation of the marrow including myeloid, lymphoid, erythroid, eosinophilic, plasma cell and megakaryocytic series. The many reports in the literature of inability of bone marrow to be of assistance in this disease may be due to the universal tendency to depend on smears of buffy coat layer. If sufficient material is aspirated with an adequate number of marrow units or particles to give a good cross section of the actual marrow organ, then pathology in that organ will be demonstrated. Many short cut methods using only a few units, letting the units clot in red blood cells, thromboplastin, or fibrin; taking only one section rather than a number of skip serial type sections, putting what few units are available through mechanical preparation rather than getting them into paraffin by careful hand methods; staining in routine tissue procedure rather than in separate stains—all these with other things explain the disappointing results reported with sections. The methods perfected by Doctor Schleicher, coupled with his ability to interpret changes in marrow sections to a degree not usually attained by most of us, have made it possible to establish patterns of disease in bone marrow. One such pattern has been presented as consistent with Hodgkin's disease in other tissues.

The value of the section method of bone marrow study has been mentioned earlier. First, bone marrow may aid in diagnosing a patient without enlarged peripheral nodes but with mediastinal or hilar nodes, or an enlarged spleen or liver. Second, the extent of disease beyond a single group of nodes may be determined by bone marrow study. This we know to be of value now that radical surgery is contemplated if the disease is localized or of aid to the roentgenologist in selecting his sites of therapy. Thirdly, bone marrow can aid in diagnosis of reticuloma in a vague symptom complex. A fourth area of use of bone marrow study may be to follow up effect of therapy in a case with previously proven dissemination of disease.

An accumulation of cases studied by node biopsy and bone marrow aspiration including adequate emphasis on the section material may lead to clues on the mode of origin of the disease, its method of spread, or its limiting factors. The use of bone marrow material for study opens an easily accessible tissue for repeated follow-up and investigation.

Summary

The section method of bone marrow study in cases of Hodgkin's disease has been presented. Of twenty-two cases of Hodgkin's disease proven by lymph node biopsy, fifteen, or 68 per cent, showed definite changes of Hodgkin's disease in the bone marrow. In addition four had changes suggestive

of this diagnosis, and three showed no evidence of the disease.

The section method of bone marrow study is, therefore, recommended as an extremely useful tool in the proper evaluation of Hodgkin's disease.

Addendum

Since summarizing the above material, four additional cases of Hodgkin's disease have been diagnosed by lymph node biopsy. Bone marrow done in all four shortly after the node biopsy revealed Reed-Sternberg cells in marrow units of three of the four. In two of the cases, at least two lymph node groups were clinically involved but in one case only a single group is known to be involved.

References

1. Wintrobe, M. M.: Clinical Hematology. 4th ed. p. 1030. Philadelphia: Lea and Febiger, 1956.
2. Cooper, T., and Watkins, C. H.: An evaluation of sternal aspiration as an aid in diagnosis of malignant lymphoma. Blood, 4:534, 1949.
3. Limarzi, L. R., and Paul, J. T.: Sternal marrow studies in Hodgkin's disease: A review of the literature and report of thirty-five cases. Am. J. Clin. Pathol., 19:929, 1949.
4. Sunberg, R. D.: Sternal aspiration. Bull. Staff Meeting Hosp. Univ. Minn., 17:389, 1946.
5. Bayrd, E. D., Paulson, G. S., and Hargraves, M. M.: Hodgkin's specific cells in bone marrow aspirations. Blood, 9:46, 1954.
6. Steiner, P. L.: Hodgkin's disease; the incidence, distribution, nature, and possible significance of the lymphogranulomatous lesions in the bone marrow: A review with original data. Arch. Pathol., 36:627, 1943.
7. Bell, E. T.: Textbook of Pathology. 8th ed. Philadelphia: Lea and Febiger, p. 379, 1956.
8. Jackson, H., Jr., and Parker, F., Jr.: Hodgkin's disease. New England J. Med., 231:35, 1944, and 233:369, 1945.
9. Schleicher, E. M.: A. A new apparatus for isolation and preparation of aspirated bone marrow particles. Am. J. Clin. Pathol., 20:476, 1950. B. An improved hematoxylin eosin stain for sections of marrow units. Stain Technol., 28:119, 1953. C. Method for making imprints and direct smears from gross marrow units. Am. J. Clin. Pathol., 15:8, 1945.
10. Ewing, James: Neoplastic Disease. A Treatise on Tumors. 4th ed., p. 1160. Philadelphia: W. B. Saunders, 1940.

Discussion

Dr. Emil M. Schleicher.—My work on diagnostic marrow patterns of Hodgkin's disease began in 1945. Some of the marrow patterns of this clinical entity have just been presented by Doctor Chadbourn. I am sure that you are in agreement with the statement of Doctor Chadbourn that "the patterns are compatible with those seen in other organs." I am aware that my method of examining a marrow sample entails a lot of work but it seems to me that the high percentage of positive samples more than compensates the effort.

I wish to compliment Doctor Chadbourn for presenting to this assembly a very informative and well illustrated paper, that I am sure, has fixed clearly in your mind the fact that Hodgkin's disease may be detected by marrow biopsy.

Dr. N. H. Lufkin.—It would appear that Doctor Chadbourn is the first to show that the clinical use of sternal puncture is comparable to postmortem study of the bones as an effective method of establishing the presence of bone marrow involvement in cases of Hodgkin's disease.

Much credit for the favorable and logical statistical results of the study is probably owing to selection of the Schleicher method to obtain and prepare the bone marrow samples. It is recalled that the average specimen obtained by this method is equal to a tissue mass one centimeter square and one millimeter thick. Such a specimen, serially sectioned, yields a relatively vast tissue area for study, and its examination and interpretation present no greater difficulties than do lymph node sections.

Dr. Robert A. Green.—The finding of such a high percentage of positive bone marrow aspirations in this group of cases of Hodgkin's disease is rather surprising. Generally speaking, bone marrow biopsy in this disease is not so highly rewarding.

It is difficult to reconcile the known high five and ten year survival rates of clinical stages I and II with the finding of a positive bone marrow biopsy since the latter must reflect widespread involvement of the reticuloendothelial system. By definition such cases would fall into the clinical stage III in which five year survivals are very low and ten year survivals almost zero. I wonder if clinical grouping of the cases reported might not reveal that they were largely far advanced, that is, stage III cases, and thus explain the high incidence of positive marrow aspirations.

I should like to call attention briefly to another technique useful in the diagnosis of Hodgkin's disease, that of lymph node imprint. The cut surface of a freshly removed, unfixed node is simply pressed several times on a clean glass slide. Slight squeezing will result in more cells in each imprint. The slide is dried quickly in air and stained in the usual way for blood smears with Wright's stain. Reed-Sternberg cells with their characteristic large nucleoli may be readily identified in this simple but beautiful type of preparation.

Dr. Benjamin Bofenkamp.—Would it be feasible in using this aspiration technique which you so well outlined, to employ it for needle biopsy of lesions thought to involve the subcarinal lymph nodes of the lung?

Dr. R. S. Ylvisaker.—Is there any difference in sites of biopsy—should it all be sternal, or should other bones be biopsied?

Dr. W. A. Chadbourn (closing).—Doctor Green has emphasized the high percentage of patients with positive bone marrow. This is partially answered by the fact that eleven or one-half of the cases had the bone marrow biopsy more than one year after Hodgkin's disease was first diagnosed and the longest interval was six years. The other four cases with positive findings were biopsied, both node and marrow, the same year, two of these four also came to autopsy the same year.

The needle biopsy technique would not in my estimation be of help in diagnosing subcarinal lymph node disease. In bone marrow biopsy we aspirate from between the tables of cancellous bone and do not enter the pleural or mediastinal space. These latter areas are too loaded with large vessels, heart, and lungs to blindly seek a lymph node here.

A Surgeon's Progress

A surgeon who has practiced his art in Minnesota for forty years reminisces about some of his experiences and about the people and circumstances that molded his life and surgical progress.

Read at a special meeting of the Saint Paul Surgical Society, St. Paul, Minnesota, March 16, 1960.

WALTMAN WALTERS, M.D.
Rochester, Minnesota

From the Section of Surgery, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

THIS OCCASION I shall always remember with the greatest of pleasure and with a feeling of deep gratitude that the Saint Paul Surgical Society would arrange a meeting honoring me, one of your honorary members, and one of the many surgeons who have admired the virility of your society, the scientific contributions of your members, and the devoted work of your secretary, Dr. William Hartfiel.

It is customary at the Mayo Clinic to write a reminiscence of one's experiences as a member of the staff. It is hoped that everyone who is nearing retirement will begin assembling material in order to be able to write it up and have it available for reading at the time of retirement or shortly afterward. Since I reach the age of retirement from the clinic this fall, I have been gathering the data and reporting on my experiences during a most pleasant three weeks spent in the Tucson area. I mention this undertaking because I recommend that all of you do the same thing, but do not wait until you reach retirement age.

Reviewing and recounting the interesting experiences I have had, first as a Fellow in Medicine

in the Mayo Foundation, then as a Fellow in Surgery in the same institution, and later as a member of the surgical staff of the Mayo Clinic have brought back many pleasurable moments. Indeed they have brought back memories of minor events, many of which have given me the same feeling of warmth and pleasure that events of greater magnitude have. Many of these memories have to do with friends met along the way in medical and surgical associations, colleagues whose interests in similar fields led to closer friendship in the environment of examining rooms, hospitals, operating rooms, research laboratories, and, of course, the library. To a medical man or surgeon these all tie in with that enveloping feeling of pleasure.

A few weeks ago when I was presented with a large inscribed silver tray on my retirement from the Board of Governors of the Mayo Clinic after thirty-one years of membership and service, I tried to express briefly my appreciation of the thought behind the gift and at the same time to appraise my forty years in the Mayo Clinic and Mayo Foundation. In groping for the expression I thought of that famous book, "Alice in Wonderland," by Lewis Carroll, whose philosophy is frequently referred to, and I thought that since my experiences as a surgeon have been pleasant that they might be said to have occurred in "a wonderland of reality or actuality." By this I mean that my experience has been everything that I could possibly want and that the environment has been exceedingly pleasant. The important associations, friendly colleagues and working environment already mentioned made it possible to carry on through a surgical career in which the care of patients, teaching, clinical investigation, research, and publications were all bound together.

Weatherwise and communitywise, the environment has been pleasant too. Even though the winters are long and severe in Minnesota, nevertheless, the skies are usually bright and the sun usually shines when it is the coldest; the springs, summers, and falls are delightful. Dr. Will Mayo used to say that for all-around working weather you couldn't beat Minnesota, for you could always keep warm in the winter, and the summers were never too hot to work with pleasure even during the long hours spent in the operating room. More efficient heating and air conditioning have made it possible to govern and regulate temperatures and humidity indoors regardless of outside weather, but it is nice to live in a community and a state in which the scenery is beautiful and in which one can always enjoy lakes and rivers, hills and forests without having to drive too far or be too long away from home or from examining rooms and hospitals.

The great pleasure given me by my election to this Society as an honorary member after having been an invited guest to your meetings for many years, and that given me by my election under somewhat similar conditions to the Chicago Surgical Society are somewhat comparable. Let me go back to the root of that pleasure. I can trace it back to the two years that I attended Shattuck School in Faribault. I enjoyed those two years very much and really learned to study while there. One either studied and got one's lessons or else one walked "squad" for an hour or two, but more than that, in the classrooms there was a feeling of competition toward excellence in scholarship. In other words, if you got an A, or more than 90, your classmates, and that meant everyone, congratulated you; on the contrary, if you had a failing mark, your classmates acted as though you had run a poor race in a track meet or played a poor game on the basketball court when it was possible to have done better.

My home was in Omaha at that time, and it was easier to take the Rock Island from Faribault to Saint Paul, and the Chicago North Western to Omaha than it was to go any other way. This usually gave me an afternoon and an early evening in this city. Since the food at Shattuck was good but similar to the routine meals of all boarding schools, a steak dinner with French fried potatoes and pie à la mode was considered a real event. I usually had such a dinner at Carling's restaurant, located at that time across the street from the Saint Paul Hotel.

Walking around Saint Paul gave me a little idea of the city. In the fall of the year I hurt my knee playing football, and although the school physician was giving me good care, my father, who was an official of the Chicago North Western Railroad, thought it would be good for me to see the company's physicians and surgeons in Saint Paul. These were the partners McLaren, Ritchie, and Daugherty.

When I was going to Shattuck, I knew that I wanted to study medicine; in fact one of the reasons I went to Shattuck was to prepare for

the college of my choice. I met, therefore, the three partners, and on other occasions when I went to Saint Paul to have my knee re-examined, they all expressed a friendly interest in my work at Shattuck and my program for college and medical school. Doctor Ritchie and I became friends and years later he was one of the authors of a surgical text that I helped edit. Later his son and I became friends, meeting occasionally at meetings of this Society and the American College of Surgeons.

My relationship to the Chicago Surgical Society lay in the fact that I spent my last two years of medical school at Rush Medical College and interned for one and a half years at St. Luke's Hospital in Chicago. The surgeons on the staff at St. Luke's were members of the Chicago Surgical Society and would take us interns to an occasional meeting and not infrequently to luncheon at the University Club. After the completion of my fellowship in the Mayo Foundation and my appointment to the staff, I continued my acquaintanceship with some of the Chicago surgeons, and through them I met others. As the years passed, these friendships broadened and were extended because of mutual interest in similar fields of therapy and investigation. When I was invited to give first the Lewis L. MacArthur lecture and later the Arthur D. Bevan lecture by the Chicago Surgical Society, they were very important occasions in my life, augmented by being elected to honorary membership, as I was to this Society.

I was thrilled to be elected also to the Minnesota Academy of Medicine and to attend its meetings where I had a chance to meet many of Minnesota's distinguished physicians and surgeons —many of whom were members of this Society.

I am using these examples to illustrate the fact that in a career, friends and an environment that is pleasing are very important, and that events transpiring surrounded by such an aura remain longest in one's memory.

Important Influences

The Doctors Mayo:—Since many men have influenced my conduct, it is hard to single out particular ones among them. There are, however, four or five exceptions to this. The Doctors Mayo probably had a supreme influence on all men who had the pleasure of associating and working with them, from the standpoint of character and life, their operative skills, their philosophy of surgery, surgical teaching, and investigation. It was my good fortune to be Dr. Charles Mayo's first assistant for almost a year and a half. Since he operated three days a week, and Dr. Will, three days a week on alternate days, the first assistant for each of the Doctors Mayo had an opportunity to work as a first assistant in the second room for the other Doctor Mayo on alternate days.

These men had done practically all types of surgery in the early periods of their surgical careers and this was continuing in the 1920's. However, with the growth of the clinic work, the special fields of surgery, such as ophthalmology, otolaryngology, and orthopedic and traumatic surgery, had been taken over by specialists who had received part of their training under Doctor Will and Doctor Charlie, and the rest of it by visiting and spending time with outstanding specialists in the United States and abroad. Neurologic surgery was considered to be a part of general surgery until about 1922 when a separate department of neurologic surgery was established, headed by the late Dr. Alfred W. Adson.

Under these circumstances, the training in general surgery was received not only on the services of Doctor Will and Doctor Charlie but also on those of Dr. E. Starr Judd, Dr. Donald C. Balfour, Dr. Verne Hunt, Dr. Walter J. Sistrunk, and Dr. John deJ. Pemberton, and the services encompassed almost the entire field of surgery with the exception of the specialties which I have mentioned. For example, Doctor Will, Doctor Charlie, Doctor Judd and Doctor Hunt did urologic operations and gynecologic operations too, considering them all to be in the field of general surgery. There was, of course, a section of diagnostic urology headed by Dr. William F. Braasch and later by Dr. Gershom Thompson, but the general surgeon trained in urologic surgery was considered able to do as excellent work in this field as in the field of abdominal surgery. The same also applied to the gynecologic surgery.

The influence of our two leaders in surgery, Doctor Will and Doctor Charlie, on the remainder of the surgical staff was profound. This was due in part to the fact that all the surgeons had received most of their surgical training under them. In addition, high regard for Doctor Will and Doctor Charlie made the younger men emulate their activities, from the professional as well as the personal standpoint. Everybody attended our staff meetings on Wednesday evenings, both the early one, which

was a clinicopathologic conference, and the late one. At the clinicopathologic conference, which was limited for the most part to members of the staff, the deaths of the week were discussed; questions were raised concerning methods of therapy that might have improved the results, or open criticism was offered of failure to carry out recognized procedures if that had occurred. Happily, this did not happen often. The point I want to make is that there was free discussion of the treatment and the reason for the patient's death, supported by demonstration of the gross and microscopic pathology found both at operation and at the postmortem examination. Dr. Harold Robertson, who had been Professor of Pathology at the University of Minnesota, came to Rochester to head the Section of Pathologic Anatomy, and he did a most excellent job in the presentation of the cases at these meetings.

The second Wednesday evening meeting was a general staff meeting held in the lobby. At it, three fifteen-minute papers were presented by members of the staff on pertinent subjects of clinical interest, including the results of clinical investigation, laboratory research, and important and interesting cases.

The essayists were held rigidly to the time limit because papers of this length were presented at national meetings. One of the nicest compliments I have heard concerning presentations of clinic men was that they stuck to their time, said what they had to say, and then sat down.

Doctor Will and Doctor Charlie were always at these meetings when they were in town and occasionally would participate in the discussion of the cases at the general staff meeting. At the clinicopathologic conference they always participated in a discussion of the cases, not because it was their prerogative but because the staff members would request them to do so.

Dr. Frank C. Mann:—Doctor Mann had come to the clinic from the University of Indiana several years before I arrived. Dr. Willis Gatch recommended him to Doctor Will as a man who could develop an experimental laboratory and whose capabilities in the field of surgery and whose knowledge of physiology were such that much could be expected of him. When I arrived at the clinic Doctor Mann had made his outstanding studies on shock and later on the hepatectomized dog. These works with associated studies of normal physiology and abnormal physiology of the liver brought him international recognition. He was in charge of the experimental laboratory and when I expressed a desire to have the privilege of working with him, he welcomed me and made helpful suggestions in my start on experimental work. Associated with him was Dr. Jesse Bollman, a physiologist and pharmacologist, in addition to being a Doctor of Medicine. Bollman and I became friends, and we worked together on several problems in the laboratory, among them, the toxemias associated with pancreatic fistulas and the effect of displacement of the liver. The accumulation of bile beneath the right diaphragm after an operation for stricture of the bile ducts suggested these studies.

I spent two mornings a week in the laboratory, and Doctor Bollman made rounds with me each Sunday. We would discuss problems associated with the patients and try to see whether they would lend themselves to studies in the experimental laboratory.

These experiences were among the most beneficial training that a surgeon and a future teacher could have. They enabled me in later years to try to inculcate in fellows working with me the ability to see problems arising in the management of patients and to plan with them how the problem could be studied in the experimental laboratory.

Dr. Edward C. Kendall:—Nick Kendall's laboratory was housed in two or three rooms on the third floor of the original red-brick clinic building built in 1914. When I came to the clinic in 1920, he had already isolated thyroxin and identified it as the active principle of the thyroid gland, for which he should have received, in the opinion of many scientists, the Nobel prize. It was interesting to go up to his laboratory, as I did from time to time, because he had taken an interest in me and I was much impressed by his scientific attainments. On about half of these visits he would be using the chemical apparatus that was spread all over his laboratory. At other times he would be sitting at a desk, with a faraway look in his eye, working with pencil and paper. When I looked at the paper, I would see mathematical figures and equations with which I was unacquainted. Usually then my visit was just an in and out, as I felt sure he did not want to be interrupted, and certainly I did not want to interrupt his process of thought.

Whenever one went up to the third floor, and

especially when we went to the staff meeting room on Wednesday night, there was an offensive odor which was difficult to describe. It was explained as being the result of Doctor Kendall's boiling down hundreds of pounds of adrenal glands from cattle in order to concentrate the fluids obtained for chemical study. These studies of his at the time were looked on as the studies of an investigator and chemist, and I am sure we did not recognize the significance of them. If we had, it would not have occurred to us that Doctor Kendall would make his famous discovery of the steroid that composes the active principle of the adrenal cortex, that this substance would be applied to the treatment of disease by Doctor Hench and that as a result of these combined studies they would both receive the Nobel prize in 1950.

Doctor Plummer with his interest in thyroid diseases had suggested to Doctor Charlie, who had a large experience with the surgical removal of goiters, that Doctor Kendall might help to find the cause of goiter. Doctor Charlie and Doctor Will, recognizing that investigations in unknown fields might lead to discoveries that would change the course of particular diseases, invited Doctor Kendall to join the clinic staff. Certainly Doctor Kendall hit the bull's eye twice when he was given a laboratory and the opportunity to work in the Mayo Clinic and Mayo Foundation as the result of the foresight of Doctor Plummer and the Doctors Mayo.

I must add too that over the continuing years in which Doctor Kendall carried on his adrenal studies many were skeptical of much of importance coming out of them, and since it was a very expensive laboratory to maintain, from time to time objections were raised to its continuation. Fortunately Mr. Harry J. Harwick and members of our sciences committee and of the Board of Governors backed Doctor Kendall from year to year until he attained success, but I shudder to think that had it not been for a few men, particularly those whom I mentioned, Kendall's work would have been discontinued because of the expensive character of the research.

Dr. Leonard G. Rowntree:—Doctor Rowntree brought to the Mayo Clinic the spirit of research in the fields of medicine and was instrumental in gathering a group of men together who had visions of the accomplishments by research in medical fields, some of whom needed to be trained in the application of research methods to clinical problems.

Credit also should be given to Dr. Henry Helmholz for stimulation along these lines, particularly in the fields of pediatric disease. His researches on pyelitis in children were outstanding and his contributions in other fields of pediatrics were internationally known and recognized. Both of these men were given laboratories to work in, animals to use, and the fullest support to their ideas of the development of their particular fields of interest.

Doctor Helmholz brought Dr. Samuel Amberg with him. Doctor Amberg had worked in the laboratories at Johns Hopkins with both Doctor Abel and Doctor Rowntree and in addition to being a clinical pediatrician he was an experimentalist in this field as well. He too helped stimulate this phase of medicine and pediatrics in the Mayo Clinic.

I could mention many others, such as Dr. Henry Plummer, Dr. George Eusterman and Dr. W. F. Braasch, who made important contributions in their fields of specialization during the 1920's and later, but time doesn't permit it. I mention these because I think it is an example of how the leaders, Doctor Will and Doctor Charlie, with foresight and vision of developments in medicine, anticipated that these could be accomplished by a proper choice of men for positions and by giving them opportunities to investigate their ideas in the laboratory and then to make proper application to clinical medicine. You can see in the description of the accomplishments of these men, how, without exception, their researches were confined to problems associated with the recognition of disease and therapy, and were of the utmost importance in their practical application.

I think this has been the keynote of the clinical investigation and research in the Mayo Clinic, namely, research along practical lines which would lead to the practical discoveries that would improve the care of the sick.

Developments in the Field of Surgery

Since all of us are surgeons, a brief view of the development of surgery as seen through the eyes of a surgeon who has had a surgical service for thirty-six years and who prior to that was a surgical assistant for four years should prove interesting.

Contrary to the custom in some clinics, the

practice of surgery by the surgeons of the Mayo Clinic was a matter of individual decision. At no time have the heads of any of the surgical sections been told what type of operation to perform in a given case. Moreover, they have had an individual autonomy. When they are appointed to the staff as surgeons, they are given every opportunity to develop in a field of general surgery, with the institution of whatever ideas, programs of investigation, and teaching methods which they consider to be best. Differences of opinions regarding methods and procedures are openly discussed at surgical staff meetings. However, if surgical results have not justified continuation of certain surgical procedures, the surgeon has not been told not to perform the procedures, but he has decided himself that the results were not equal to procedures that other surgeons were using.

This independence permeated the clinic, and again has showed the foresight of the founders, for instead of impeding progress and preventing new ideas originating in the minds of younger, active, ambitious members of the staff, it stimulated them because they knew their program would always be supported provided that it conformed in general with the practice of medicine and surgery in other institutions as well as our own. As a result, you will remember that from time to time different types of surgical procedures and varying results have been reported by different surgeons at the Mayo Clinic.

One example from a field in which I am particularly interested, that is, surgery of the stomach for gastric and duodenal ulcer, will be mentioned. After returning from a study of this problem in the German surgical clinics, I began to employ the Billroth I resection for duodenal ulcer. Within the next two years I had used it in a sufficient number of these cases to be able to evaluate the results over a short period. I was distressed to find that the incidence of recurrence of the ulceration was about 5 or 6 per cent. I abandoned the operation in favor of the Billroth II or Polya operation. However, during the war while I was away, two of our surgeons, with the idea that perhaps a more extensive resection with the employment of the Billroth I procedure might give better results than had been obtained before, performed this operation in a series of these cases, but as time passed, unfortunately their experience was similar to my own in regard to recurrent ulceration. Since that time relatively few Billroth I anastomoses, in comparison to the Billroth II or Polya anastomoses, have been performed for duodenal ulcer at the Mayo Clinic. It is a good operation, however, for gastric ulcer, for certain small scirrhous carcinomas involving the lower portion of the stomach, and probably for certain patients with duodenal ulcer if a vagotomy is added.

I should like to mention two or three of my own interests which were developed in part by stimulation by older members of the staff and in part by opportunities given to me to carry out programs of investigation. The first of these was shortly after I obtained my surgical service in 1924 when Doctor Braasch, after hearing Doctor Quinby of Boston report his results from plastic operations in the treatment of hydronephrosis, suggested to me that I do some of these operations. He saw to it that patients were referred to me in consultation on whom the plastic procedures might be carried out. After studying the reports of Quinby, and those previously published by Kuster of Germany, I began to resect the renal pelvis, sometimes with reimplantation of the ureter in the dependent part of the resected pelvis, as these investigators and surgeons had advised. The results were good.

In my trip to the foreign surgical clinics in 1927 I saw Hans Wilbolz of Berne, Switzerland, perform two of these operations. In discussing the problems associated with these procedures, he told me that he had done a great many of them on patients with infected hydronephrosis and some patients with bilateral hydronephrosis. His results had been satisfying, and in many instances very good. When I returned home, it happened that I saw two patients with large bilateral hydronephrosis with infection on whom I successfully operated. The results were so good that I was proud to present the patients at a meeting of the Minnesota Medical Association here in the Saint Paul-Minneapolis area. In 1933, Doctor Priestley and I presented a large series of these cases at the meeting of the American Urological Association in Minneapolis.

In 1933, at the meeting of the American Surgical Association to which I had just been elected to membership, I heard Harry Lyle, of Cornell University and St. Luke's Hospital in New York, report successful results from use of the Ombrédanne operation for hypospadias. I looked up Ombrédanne's original article and found that he

had carried out the operation on more than 120 male children, had followed them through puberty and had had a high incidence of success. I then began using this operation, and much to my pleasure, successes greatly increased over those attained with previous methods. The extension of plastic surgery in this field by the late Dr. Hugh Cabot and my colleague, Dr. Ormond Culp, is known to all of you who are interested in this field of surgery.

These results led to an interest in other plastic operations and I began to employ the Torek operation for the treatment of undescended testes after Dr. Herbert Willy Meyer had described the excellent results on follow-up many years after operations performed by Dr. Franz Torek of New York. Torek, you will recall, was a Viennese American, who performed the first successful resection of the esophagus in this country. These operations and the report I made at the German Surgical Congress in 1931 on the postoperative renal function of seventy-six patients with exstrophy of the bladder on whom Doctor Charlie and I had performed ureterosigmoidal anastomosis and cystectomy did more, I think, to start me on my way in urologic surgery than any other particular contribution that I made in this field of surgery.

I mention these not to be boastful but to show how opportunities present themselves for carrying out new procedures in surgery, and how opportunities, if recognized, arise for carrying out studies.

During this time Drs. Albert Snell, Jesse Bollman, Carl Greene and I had been actively interested in lesions of the liver and biliary tract. Doctor Rowntree, recognizing the opportunities available for developing better tests of liver function, and Doctor Mann, by his physiologic studies after hepatectomy in experimental animals, stimulated us to apply in medicine and surgery the results of some of the studies that they and we had carried out. Because of several of these studies I began to prepare jaundiced patients for operation by the intravenous administration of glucose to support the liver, and of a weak solution of calcium chloride to reduce the coagulation time of the blood. The reduced coagulation time, in turn, would reduce the incidence of fatal postoperative hemorrhage. These projects together with the opportunity of working with Doctor Judd, who was particularly interested in lesions of the biliary tract, and the early opportunity of dealing with many complicated cases of biliary tract disease, even strictures of the common bile duct, aroused my interest in this particular field of surgery.

Here again, I think you will recognize the importance of the influence of older men interested in the development of younger men and in giving them opportunities to carry out ideas which the older men may have generated, or suggested. Such influence extends far beyond the year, or the particular few years, of the study.

Doctor Will and Doctor Balfour who were particularly interested in gastric surgery gave me every opportunity to work in this field so that I became interested in cancer of the stomach in addition to peptic ulcer. My interests have continued through the years and I contemplate making comparative studies of these conditions in the Orient after my retirement.

Before World War II one wondered what further developments could possibly occur in the field of general surgery. However, as always, further developments will occur. One only needs to mention the development of the extracorporeal heart-lung apparatus for open-heart surgery, the use of autogenous and then synthetic grafts for vascular replacements and the remarkable developments in the field of cardiac surgery by different surgeons throughout our country, to indicate the continuing advantages of combined clinical and experimental forces in solving problems relating to disease.

No cavity of the human body is now hidden to study and exploration in the correction of deformities or disease. Undoubtedly techniques used to correct lesions will improve in all areas of the body and probably better methods of treatment will decrease the risk of surgical procedures even further. It might be said that further developments in these areas seem unlikely. But that was what we thought about the development of surgery in the 1920's and again in the 1930's, and in the 1940's. Once again in thinking over the almost forty years that I have been in surgery I would say that the greatest development in the fields of surgery has occurred in the last fifteen years.

I want to tell you how pleased I am to have been invited to be your guest this evening and to have an opportunity to reminisce of the life and career of a surgeon who has practiced in Minnesota for forty years.

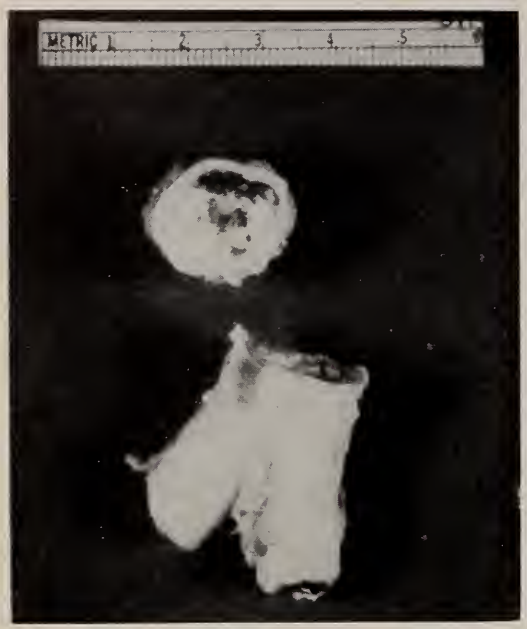


Fig. 1. Specimen of resected aorta and common iliac arteries showing the obliterating tumor thrombus.

Tumor Thrombosis

Of the Abdominal Aorta and Iliac Arteries

Report of a Case

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TOTAL OCCLUSION of the abdominal aorta and common iliac arteries by a tumor thrombus is apparently a rare enough entity to warrant its being reported. Several reports of tumor emboli and thrombi with obturating occlusion of the arteries have been documented in the literature.

Thompson and Evans,[1] in their paper on paradoxical embolism in 1930, include one case of a tumor embolism involving the middle cerebral and coronary arteries as a direct metastasis from a teratoma testes. Groth, in 1940,[2] reported a successful embolectomy of a tumor embolism to the left common femoral artery from massive pulmonary metastases two years after amputation of the right lower extremity for the primary osteogenic sarcoma of the femur.

A thrombus containing tumor cells found in an atheromatous ulcer was reported by Branwood and Glazebrook in 1946,[3] in a patient with a sarcoma of the diaphragm with multiple pulmonary metastases.

An abdominal aortic and renal arterial occlusion by a massive embolus in a ten-year-old girl apparently from a myxoma of the left ventricle was reported in 1947 by Young and Hunter.[4]

Till and Fairburn in 1948[5] described a femoral arterial thrombus containing tumor cells from an oat-cell carcinoma of the lung with demonstrable involvement of the pulmonary veins by tumor.

An unsuccessful axillary artery tumor embolectomy was reported by Loosemoore and Whittick in 1951.[6] In their patient, a sixty-four-year-old woman, the embolus presumably came from the lungs containing multiple secondary neoplastic lesions three years after an amputation of the lower extremity for a synovioma of the knee. At necropsy this patient was found to have a large propagation of the tumor along a major pulmonary vein with an embolus from this occluding the vein secondarily. There were also multiple metastases found in the cerebrum, cerebellum, lumbar vertebrae, and thyroid gland but no other gross intravascular tumor masses.

A case of gross arterial embolism from a myxosarcoma of the lung with pulmonary vein invasion was reported by Miller and Jackson in 1954.[7] In this patient, tumor emboli were found in the left atrium, right meningeal, and splenic arteries with invasion of the heart, brain, and spleen, respectively, by tumor tissue presumably from the emboli.

Cera, Karlinsky, and Rodin in 1957[8] reported a case of a squamous cell carcinoma of the lung that had metastasized to the heart vessels and myocardium but had also embolized to and obstructed a coronary artery causing the patient's demise.

The following is the report and discussion of an instance of tumor thrombosis of the abdominal aorta and common iliac arteries and later of the external iliac and common femoral arteries.

Report of Case

This is the case history of a fifty-eight-year-old, white aviation mechanic who was seen in January 1958 for ischemia of the lower extremities. He had a recent past history of increasing soreness of the muscles of the legs and thighs on walking of approximately five months' duration and anorexia of two months' duration.

The patient appeared chronically and acutely ill. He had obviously lost weight and was bedridden with constant pain in his left foot and leg which he held down over the side of the bed for partial relief. The blood pressure and other vital signs were all normal. There was swelling and rubor on dependency in the left foot with early trophic changes in the skin.

Both femoral arterial pulses were barely palpable and no definite arterial pulse could be made out distally in the lower extremities. A tentative diagnosis of occlusion of the aorta secondary to arteriosclerosis was made.

On February 1, 1958 an abdominal aortogram was made which revealed a complete occlusion of the aorta a little below the renal arteries. There appeared to be some delayed filling of both common femoral arteries.

On February 6, 1958 a completely thrombosed aorta and common iliac arteries were resected (Fig. 1) and replaced by a braided nylon arterial prosthesis. The recovery from this procedure was essentially uneventful. All pulses returned in normal amplitude in the right lower extremity and in the left femoral and popliteal arteries. The pain in the left foot disappeared and both feet became warm and dry. Within two weeks the patient could walk as far as he wanted without discomfort. However, he did not regain his strength in normal fashion and his anorexia persisted. He was given treatments with a cortisone derivative and gained 9 pounds in weight but still remained 20 pounds underweight.

On May 5, 1958, three months postoperatively, the patient returned with the complaint of some back pain and pain in the left foot on walking one block. The examination revealed a normal external iliac pulse but none below on the left side. On the right side the pulses were normal. Both feet were warm and dry as before. A diagnosis of occlusion of the left common femoral and distal external iliac artery was made. On May 14, 1958 a left iliofemoral arteriogram corroborated this diagnosis.

On May 28, 1958 a thromboendarterectomy of the left distal external iliac and common femoral arteries was performed. The preoperative pulses returned to the left lower extremity and the patient again could walk without difficulty. Except for a collection of serum in the operative site the recovery was uneventful. His anorexia and weakness continued.

The report of the microscopic study of the aorto-iliac specimen revealed the presence of what appeared to be tumor cells in the occluding thrombus. A review of these tissues was made including a more intensive study of the second endarterectomy specimen. This revealed the presence of undifferentiated tumor cells in both specimens (Figs. 2 and 3). The origin of these could not be identified.

On August 18, 1958 the patient returned with the complaint of pain in his left groin and medial thigh, and weakness of the left thigh muscles. Examination at this time revealed no change in the vascular status, tender-



Fig. 2. Thrombus (*in lower third of the illustration*) and tumor cells (*above*) in abdominal aorta. The thickened intimal vessel wall is seen in the bottom of the photograph.

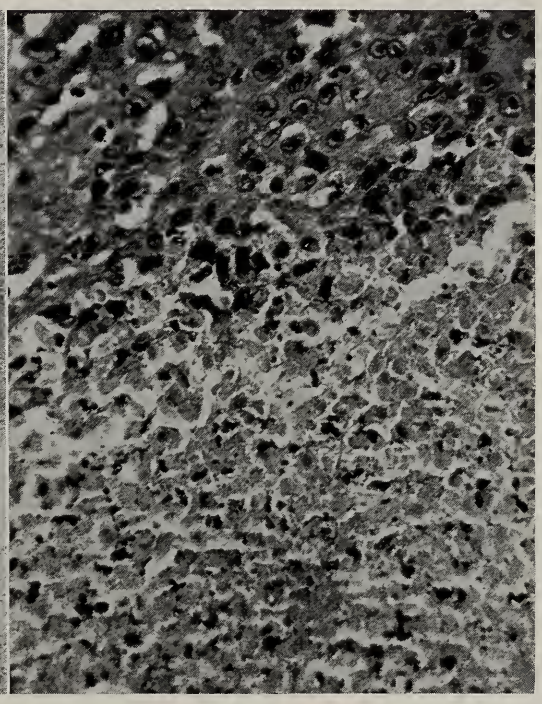


Fig. 3. High power of tumor (*upper half of photo*) and thrombus (*lower half of photo*) in resected abdominal aorta.

ness over the left groin and pubis, and a weakness of the adductor muscle group but no paralysis.

A complete urological examination including an intravenous pyelogram was negative. An x-ray of the pelvis revealed an osteoclastic lesion of the anterior pubic



Fig. 4. Roentgenogram of pelvis showing osteoclastic lesions of the left pubic ramus, femoral head and ilium.

ramus on the left side and suggestions of small lesions in the ilium, neck, and greater trochanter of the left femur (Fig. 4). The spine and chest x-ray examination were essentially negative. On August 21, 1958 an osteotomy of the pubic ramus was made which revealed a tumor of the bone just breaking through the cortex. This was biopsied. Exploration of this area revealed no evidence of vascular or nerve involvement.

Microscopic study of the marrow smears and of the metastatic tumor proper revealed what was thought to be a sarcoma possibly of osteogenic origin (Fig. 5).

The patient was given a total of 1850 roentgens of radiation therapy to the left inguinal region in treatment of this osteolytic lesion in the bone. This was divided into sixteen daily doses. On completion of this therapy the pain and the weakness in the left adductor muscle group were much less and the patient could get up and about with the use of a cane. Approximately one month after this x-ray therapy, further x-ray examination revealed that the tumor process had extended well into the acetabular area and into the ilium. There was also some evidence that the body of L-4 vertebra was becoming demineralized.

Repeated chest x-rays and electrocardiographic studies over the previous few months revealed no abnormalities.

On March 31, 1959 the patient was again admitted to the hospital. At this time, he was in much pain in both groins and thighs and showed a great deal of weight loss and inanition. He was incoherent with only occasional episodes of lucidity and was obviously in a terminal state. No other gross changes of note were made on the physical examination. The patient finally expired quietly on April 17, 1959.

Postmortem examination revealed the aorta above and below the arterial prosthesis to be free of tumor growth both within and outside the lumen. The arterial prosthesis was patent, intact, and no evidence of tumor cells was made out. The left external iliac and common femoral arteries were also patent and free from any evidence of tumor. The lesions of the pubis, femur, and ilium were essentially unchanged with obvious tumor involvement of the bone but with no significant local extra-osseous extension. There were numerous small areas of secondary malignancy throughout the pulmonary parenchyma histologically similar to those found in the pubis and in the resected abdominal aorta. The remaining portion of a complete autopsy, including the central nervous system, revealed no evidence of tumor cells. The heart was normal in all respects with no evidence of a permanent or temporary right to left shunt.



Fig. 5. Microscopic view of biopsy of osteoclastic lesion of the left pubic ramus.

Discussion

Certainly blood-borne metastases whether they arise from single cells or large groups of cells must enter a vein from the primary tumor and travel to their secondary location as emboli. However, it is not usual that such emboli are clinically identified unless they occlude a large enough blood vessel to produce acute symptoms. As has been pointed out above, several of the latter type situations are reported in the literature and some with subsequent successful embolectomy.[1,2,4,6-8] But the case re-

ported here does not fit into this category. It does seem to fit with those cases reported in the literature where large numbers of tumor cells have been found with arterial thrombi both occlusive[5] and non-occlusive,[3] and therefore seems more appropriately described as an instance of tumor thrombosis.

It has been suggested by the studies of Fisher and Baird[9] that patients with neoplasms have a tendency to arterial thrombosis even without tumor cells being present in the occluded vessels and that the presence of tumor cells may enhance thrombus formations. In our case, the question arises whether the tumor cells were present first in the artery and produced secondary thrombosis or whether a thrombus was present which simply trapped tumor cells. Since the vessels in our patient were sclerotic it is likely that the thrombus formed trapping the tumor cells in first the aorto-iliac and later the iliofemoral areas.

Except in the case of Branwood and Glazebrook[3] where an intimal plaque involvement was seen, there was no instance found in the literature in which the neoplasm had invaded the wall of the blood vessel. There was no such involvement in our patient either (Fig. 2). This may be due to the fact that too little time had elapsed in any of the patients for this to take place.

Except for the original diagnosis of undifferentiated sarcoma in the aortic thrombus which may have originated in the pubic ramus, no further light is cast on the origin of this tumor. Original x-ray examination, made incidental to the aortography and arteriography, reveals no apparent changes in the bone of either the pelvis or the lumbosacral spine and femur. This is no proof that the tumor tissue was not primarily present at these sites, however.

In several of the cases reported in the literature[2,3,5-8] the pulmonary lesions were large and grossly visible on x-ray examination and at postmortem, the pulmonary veins were obviously involved. Whereas in our case it was at no time apparent on chest x-rays and at postmortem, the scattered small secondaries were only a few millimeters in diameter and showed no obvious vein involvement.

It is likely that the sarcoma cells metastasized from the lung into the arterial blood stream and were caught first in the thrombosis of an atherosclerotic aorta and common iliac arteries and later in an atherosclerotic external iliac and left common femoral arterial segment. With an intact heart and great vessels no other reasonable or even remote possibility suggests itself to the author as an explanation in this case.

The pain in the upper thigh is difficult to explain on the basis of the left pubic lesion alone. This is especially true in view of the fact that the femoral and obturator nerves were at no time involved with the tumor process. It is further difficult to explain when one finds that at autopsy there was no evidence of impingement on or involvement of the central nervous system with tumor. The exact mechanism of this pain remains unclear.

It can be postulated in view of the findings in this case that the tumor emboli were small enough to pass through the ordinary capillary beds since there were no other peripheral manifestations of tumor metastases; and that only where an extremely narrow lumen existed in the pathway and/or actual thrombosis had taken place, were the cells agglomerated. A final conclusion of the case then must still be that the primary tumor was that of osteogenic growth in the left superior pubic ramus which metastasized with multiple secondary foci of low-growth activity throughout the pulmonary parenchyma. These pulmonary foci, in turn, were the source of the secondary tumor thromboses found in the aorto-iliac and the left iliofemoral arterial regions.

References

1. Thompson, T., and Evans, W.: Paradoxical embolism. Quart. J. Med., 23:135-150, 1929-30.
2. Groth, K. E.: Tumor embolism of the common femoral artery—treated by embolectomy and heparin. Surgery, 8:617-632, 1940.
3. Branwood, A. W., and Glazebrook, A. J.: Sarcoma of the diaphragm with an intra-aortic metastasis. J. Path. & Bact., 57:286-289, 1946.
4. Young, R. D., and Hunter, W. C.: Primary myxoma of the left ventricle with embolic occlusion of the amdominal aorta and renal arteries. Arch. Path., 43:86-91, 1947.
5. Till, A. S., and Fairburn, E. A.: Massive neoplastic embolism. Brit. J. Surg., 35:86-89, 1948.
6. Loosemoore, T. G. E., and Whittick, J. W.: Gross tumor embolism of the axillary artery by malignant synovioma. J. Path. & Bact., 63:133-138, 1951.
7. Miller, A. A., and Jackson, F. B.: Gross arterial embolism by a myxosarcoma of pulmonary origin. J. Path. & Bact., 68:221-224, 1954.
8. Cera, L. J., Karlinsky, W., and Rodin, A. E.: Tumor embolism of the left coronary artery. Am. Heart J., 53:472-478, 1957.
9. Fisher, E. R., and Bair, W. F.: The nature of arteriolar capillary occlusion in patients with carcinoma. Am. J. Path., 32:1185-1197, 1956.

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Editorials

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LAW—MEDICINE—RESEARCH

The future of a law-medicine relationship within a university environment is encompassed in the word *research*. This word, as it pertains to medicine, is well understood by medical practitioners. In law, research is an almost unknown endeavor. Medicine traditionally has advanced through the scientific laboratory. Law advances through the public courtroom and the attitudes of the market-place. The strength of medicine is measured by the quantity and quality of scientific research. The strength of law is marked by its acceptance among common men living their daily lives. Within the past decade, legal scholars in the university environment have just begun earnest research programs dedicated to the improvement of law and justice. A few voices in the past half-century have called upon the legal profession to undergird legal research with an eye to the improvement of justice. Never-theless, it is a fair statement that even today most lawyers conceive the law's progress to be the result only of court decisions and legislative enactments, not university research. Medicine practices at its finest within great university environments. Law practices at its finest within courtrooms, hearing offices and legislative halls.

The first blessing which medicine bestows on law is the acknowledgment of the wisdom in scholarly research. One practical result of this acknowledgment was described in the previous editorial on "Homicide" published in the February issue of this journal. More scholarly research in the law-medicine area is inevitable. Not only the example of medicine but the complexities of modern urban, industrial society demand of law, thoughtful research and experimentation in the laboratory—albeit the laboratory of a human community. A university oriented law-medicine center is the obvious agency to provide such a common research program.

What areas of human life will require major law-medicine research? One foremost in the picture today involves the mentally disabled and the law. Already in several law schools, joint efforts in this area of study are underway. The University of Pennsylvania, Temple University, Yale University, Western Reserve University, are among these institutions already concerned. But more important, the practicing lawyers of America through the American Bar Association Foundation have assigned this topic as one for immediate research activity. Through a special committee composed of Judge Stephan C. Chandler, U. S. District Court of Oklahoma, Judge David L. Bazelon, U. S. Court of Appeals of the District of Columbia, Frank P. Fosgate Esq., of Wisconsin, Judge J. Howard Ziemann, Superior Court of California and this writer, a survey of medico-legal procedures in the commitment and discharge of the mentally ill will soon begin. A grant in excess of $80,000 from the National Institute of Mental Health will underwrite this law-medicine research project.

Further research possibilities in the forensic psychiatry area would include a study of the criminal insanity rule which is now in a period of great intellectual and practical fermentation. The *McNaghten rules* of 1843 have been seriously altered by the *Durham rule* of 1954. Under the former rule, an accused person is criminally liable if during the act he knew right from wrong and if he knew the act he was doing; under the latter rule he is liable if the act he did was not the product of a mental disease or defect. What are the effects of each standard of insanity on the local communities? Are criminals escaping punishment? Is the accused a criminal or a patient? How should this be determined? By whom? How and when should an insane accused person be released to return to society? These questions require more than the traditional emotional answers given by juries of common citizens. Intellectual solutions are in order and desparately needed.

Even further in the future, law-medicine research must aid in the preservation of social peace, individual liberty and personal equality. Today it is obvious that mental behavior of the individual and the group is crucial to conserve our society under law. Professors Brown, Bonner

and Weir in *The Next Hundred Years,* 153-4 (1957) have stated:

"When we take the very long view of man's world in the next century we see that the main problems are less those of technology than they are those of men getting along with other men, communicating with other men, and organizing themselves in such a way that their genius and imagination can be vigorously applied to the problems that confront them. Our major problems involve the enriching, enlarging, improving and mobilizing of our intellectual forces.

* * *

"We have seen that, in principle, man can, if he wills it, create a world where people can lead lives of abundance and creativity within the framework of a free society. It is apparent that there will be many difficulties; there will be many dangers. But it seems reasonably clear what man must do in order that the path may be negotiated. It remains to be seen whether he will recognize these problems in time and proceed to create a still higher level of integration, or whether he will permit his civilization at its present stage of development to disintegrate, perhaps never to reappear. The future of industrial society revolves around the question of whether man can learn to live with man."

The tool man uses to get along with other men is law. The ideas man uses to guide this tool emerge from his mind which medicine can reveal, analyze and explain. A law-medicine center should be dedicated to this joint research so vital to the future of man.

A more immediate research project for law-medicine involves the use of the medical expert witness in personal injury jury trials and administrative hearings for workmen's compensation, social security or veterans benefits. Each of these facets of common law justice requires truthful facts and opinions upon which to base the law and to produce a just and fair decision. Is the adversary proceedings the pathway to truthful medical facts and opinions? Should the doctor be the court's witness, not a party's witness? Can administrative referees render valid awards on written medical reports alone?

The impartial medical panel for jury cases has been invoked in several communities. In New York City, such a procedure includes court testimony. In Cleveland, the plan does not go as far as the court trial but is limited to pre-trial activity only. Which is better for the administration of justice and why? Answers to these questions are the responsibility of law-medicine research in a scholarly university environment outside the arena of legal conflict where partisan, adversary opinions predominate.

Many persons commend the law-medicine courses and institutes sponsored throughout our nation today. None can deny their value in bringing better understanding between lawyers and doctors. The true mark of success in the law-medicine relationhip will not emerge, however, until scholarly university research is dedicated to the advancement of law-medicine justice.

Oliver Schroeder, Jr.

FOOD AND RESTAURANT SANITATION CONTROL

Most physicians are aware that much of the illness popularly referred to as summer flu, stomach flu or intestinal flu, is, in fact, food infection or food intoxication, caused by faulty food handling practices either at home or in a public establishment. Families have learned to accept an occasional gastrointestinal upset as something that is "going around" and that will pass in a day or two. For this reason, relatively few of such cases are treated by physicians or come to the attention of health officials. It is usually only when a large number of people are afflicted at once, as a result of eating a meal together, that any publicity is given to the episode. This is the reason that church or community dinners are so often incriminated while, as a matter of fact, many more cases may occur independently from eating at a public restaurant.

Although the occasional case of typhoid fever that occurs in Minnesota is most likely to have been transmitted by careless handling of food, now that water and milk supplies are under improved sanitary control, other salmonella infections and staphylococcus food poisoning are the food-borne illnesses that are of greatest concern to public health officials because of their frequent occurrence. Respiratory infections, also, may be transmitted through food service when the food handling personnel are unaware of, or indifferent to, the hygienic principles involved.

People, generally, regard an inspector as a necessary evil inherent in any control program. They expect him to make someone do something because it is "the law" and as a penalty for wrongdoing. Little is gained by punishing a restaurant operator for a violation of good practice unless he is informed of the public health reason behind the rules. He is likely to know that the inspector probably will not return for some time, and unless he is convinced that it is for his own economic good

to comply all of the time he may soon forget to do so. No restaurant operator wants to make his customers sick, but unless he has some knowledge of how his faulty food handling practices have been or can be responsible for illness he will continue to operate as he always has. It is true, of course, that some operators refuse to be convinced, but this, too, is probably due to the lack of reporting of cases of illness.

Because of a recognition of these factors, the state food service control program in Minnesota is based more on educational measures than on police or enforcement methods. Even with an inadequate staff, capable of making less than one-third of the inspections that should be made, this approach has been effective in a small way. Most food service personnel and operators are interested in learning the elements of disease transmission and take pride in the knowledge they gain, but inability to make return inspections with the desirable frequency (at least two inspections a year) reduces the effectiveness of the program. Efforts to obtain the necessary legislation to expand the program have been unsuccessful but will be continued.

Minnesota has many of the finest eating places to be found anywhere. The operators of these, in general, endeavor to adhere to the best sanitation practices and favor an effective program of control to maintain high standards for all establishments. A person who has become ill of food poisoning often has at least a vague idea of where he acquired his illness and, while he does not go to the trouble to report to anyone, he is likely to avoid that establishment and possibly any other in the same community or even the same section of the state. In the case of an out-of-state tourist this aversion may be great enough to make him feel he is not safe, because of an inadequate control program, to eat a meal in a public place anywhere in the state. Thus, the lack of an effective program reflects not only on the establishment involved but also on the industry generally.

F. L. Woodward

THE LUPUS ERYTHEMATOSUS AGGLUTINATION TEST

Since the original descriptions of the lupus erythematosus cell, an impressive array of techniques for demonstrating the presence of lupus erythematosus cell factor has appeared. The large number of methods available suggests that none of them are completely satisfactory and all of them have serious limitations.

There is ample experimental evidence to show that the only contribution which the patient must make in these tests is the lupus erythematosus cell factor. The nucleoprotein substrate upon which the lupus erythematosus cell factor exerts its activity may be provided by the patient, by another human or it may be obtained from animal or bacterial sources. The indicator system used to identify combination of the lupus erythematosus cell factor and nucleoprotein may be a viable leukocyte, hemagglutination, immunofluorescence or complement fixation.

Our current study describes the results of the reaction between polystyrene particles which have been coated with calf thymus nucleoprotein and the serum of patients with systemic lupus erythematosus. The coated particles have been shown to remove the lupus erythematosus cell promoting activity from serum and the test can be inhibited by preliminary treatment of the coated particles with desoxyribonuclease. Particle agglutination in dilutions greater than 1:8 are considered positive. One of the outstanding advantages of this test system is its ready adaptability to running large numbers of tests simultaneously.

Sera from 1,000 patients, thought not to have systemic lupus erythematosus, were found not to agglutinate the coated polystyrene particles. Approximately 3 per cent of these sera, however, agglutinated uncoated polystyrene particles and for that reason such "non-specific" reactions must be identified by including a control consisting of the serum under examination and uncoated particles.

Sera from seventy patients meeting the clinical criteria and, in some instances, the pathologic criteria of systemic lupus erythematosus were examined by both the agglutination test and by the classical L-E cell test. Thirty-six of seventy had both tests positive. Twelve of seventy had a positive L-E cell test and a negative agglutination test. Twenty of seventy had a positive agglutination test and a negative L-E cell test.

It is concluded that the L-E agglutination test using nucleoprotein coated polystyrene particles is of value in the detection of L-E cell factor and is readily adaptable for the examination of relatively large numbers of sera simultaneously.

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Columbia University

(Turn to Page 399)

VOCATIONAL REHABILITATION

In the first of this series of articles on rehabilitation in Minnesota, Dr. Frank Krusen not only presented the modern concept of rehabilitation but also told how the State Division of Vocational Rehabilitation has more than doubled the number of disabled persons rehabilitated in the past four years —from 582 in 1955 to 1173 in 1959. This article will attempt to present the reasons for this growth of the rehabilitation movement, an overview of the operation of the Division of Vocational Rehabilitation, and how members of the medical profession have vigorously and effectively contributed to the development of a good rehabilitation program in Minnesota.

In the history of sociological movements, vocational rehabilitation is a comparative newcomer as the first federal legislation providing for the retraining of disabled workers was passed in 1920. Minnesota was among the first states to adopt enabling legislation that established a state rehabilitation agency that same year. These pioneer programs in vocational rehabilitation developed the state-federal partnerships that still exist today, but until 1943 vocational counseling and limited retraining programs were the only services provided.

Legislation passed in 1943 set the pattern for services of vocational rehabilitation as administered today. Mental illness and mental retardation were recognized as vocational handicaps and new services were added to the basic program of vocational counseling and training. These included medical services to reduce the functional limitation imposed by a disability, prosthetic devices, maintenance during training period, tools and equipment needed for employment and increased effort in job placement.

From 1943 to 1954, there was a slow and steady development of vocational rehabilitation in Minnesota, but it was the passage of Public Law 565, *"The Rehabilitation Act of 1954,"* that marked the opening of the modern era in rehabilitation. By substantial increases in the budget for rehabilitation, it has made possible expansion of staff and offices to bring rehabilitation closer to all areas of the state and reduce the geographical area and the number of clients each counselor must serve; many more severely disabled persons can be provided the physical restoration and evaluative services, and staff time and case service funds are available to provide prevocational diagnoses and "job-readiness" psychological adjustment for the many clients whose psychological and emotional problems are often greater than their physical impairment.

By making available federal grants for extension and improvement of rehabilitation facilities, Public Law 565 has added many new resources for evaluation and training of the severely disabled in Minnesota and during the past four years there has been a very gratifying increase in the number of mentally ill, mentally retarded, and other types of severely disabled persons among the persons rehabilitated.

This progress in vocational rehabilitation has been concomitant with progress in medical science. New drugs and psychotherapeutic techniques have tremendously increased the number of mentally ill persons who are able to leave a hospital and embark upon a vocational rehabilitation program to prepare them for a return to their homes and productive employment. Similar advances in treatment of neurological diseases, tuberculosis, poliomyelitis, diseases of the heart and cardiovascular system and orthopedic disabilities have all given new life and new hope to persons who might have been considered hopelessly disabled a few years ago.

All of this has had a dramatic impact upon vocational rehabilitation. It has focused public attention upon the sociological and economic disaster caused by disability, which in turn, has resulted in legislation like Public Law 565. It has created a new concept of the type of person who needs and can benefit from rehabilitation services and it has strengthened the relationship between the medical profession and vocational rehabilitation. For it is by working together, sharing their professional skills and knowledge, that the doctor and the rehabilitation counselor can be of greatest service to their mutual patient/client.

Evidence of this mutual cooperation is shown by vocational rehabilitation caseload records which show a steady increase in the number of rehabilitants who were referred to the division from the medical profession. In the past few years, medical resources have been first in the number of clients referred to the division, accounting for nearly a third of the persons rehabilitated each year.

The importance of early referral to a vocational rehabilitation resource has been demonstrated time and time again in Minnesota's major rehabilitation centers. When a severely disabled person is contacted by a rehabilitation counselor soon after the

onset of disability (often while the patient is still hospitalized), there is a much better prognosis for successful rehabilitation than if the patient is rehabilitated physically and sent back to his home and months, or even years, go by before any contact is made with a vocational rehabilitation agency. And the same holds true in cases where the private practitioner had made the earliest possible referral of the patients who may be aided by vocational rehabilitation.

Often the goal of a useful, productive life represented by a definite plan of vocational rehabilitation gives the despondent and indifferent patient the necessary motivation to follow through with a lengthy, tiring program of treatment and therapy planned by his physician.

By strengthening the inter-action and coordination of services between physical and vocational rehabilitation, between the doctor and the counselor, a much more complete and comprehensive rehabilitation service will be provided for the disabled. The increasing number of aged and disabled persons in our population make it imperative that such services be expanded. For unless they are restored to social and economic self-sufficiency, care of the aged and disabled will become a tremendous drain upon the economy of our communities, state and nation.

August W. Gehrke
State Department of Education

EFFICIENCY—GOVERNMENT STYLE: A FABLE (???)

A small private hospital of 100 beds ran efficiently with an administrative staff of one administrator, one business manager, and five secretaries. The house staff consisted of three residents and six interns who were paid by the hospital. They were taught by the staff doctors who were in private practice and received no pay. This hospital was filled with patients who received excellent care. There was no waiting list, and the people in the community were happy and healthy.

Then this fine hospital was taken over by the state. First came the administrator and his two assistants and each had two secretaries. Since there was not enough office space, five patient rooms were converted into offices. Next arrived the business manager with his two assistants and their six secretaries and with them went ten more hospital beds. The efficiency expert arrived with an assistant and three secretaries, and they used up five more rooms. The professional staff expanded to twelve full time chiefs, each with a full time assistant and each one with at least one secretary. The house staff went from nine to fifty-five. Each department needed a research laboratory, so more beds were appropriated. When the reorganization was over, the hospital, which had been operating on a budget of $300,000 a year —paid by the patients—was costing three and a half million a year — paid by the taxpayers. This, of course, did not include the $300,000 received in federal grants for research of questionable necessity and merit—also paid by the taxpayer.

At this time, it was discovered that the need for office space had left only one bed for patients. Immediately each department claimed the single bed. As a result, the only patient in the place alternated between complete neglect, examination, and treatment by the whole staff. The strain of fifty physical examinations a day, supplemented by millions of laboratory tests, conflicting, cancelled, and reordered orders, along with infusions, transfusions, enemas, lavage, gavage, etc., brought on his early demise. Autopsy revealed death was caused by exhaustion, acute therapeutic anemia, and a perforated stress ulcer.

With the death of the single patient, the last remaining bed was converted into a conference room. Here the staff met and, after months of deliberation, came up with a brilliant solution—they sent a request to the state legislature for ten million dollars to build a new 100-bed hospital.

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Denver

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SOFT TISSUE INJURIES OF THE HAND

(Continued from Page 379)

References

1. Mason, M. L.: Rehabilitation of the hand. Am. Acad. Orthop. Surgeons, Lect., 6:95-106, 1949.
2. Bunnell, Sterling: The early treatment of hand injuries. J. Bone & Joint Surg., 33-A:807-811, 1951.
3. Cutler, C. W., Jr.: Care of hand injuries. *In* Early Care of Soft Tissue Injuries. Ed. 1, fourth printing, pp. 119-122. Chicago, Illinois: American College of Surgeons, 1958.
4. Bunnell, Sterling: Surgery of the Hand. Ed. 3. Philadelphia: J. B. Lippincott Co., 1956.
5. Flynn, J. E.: Problems with trauma to the hand. J. Bone & Joint Surg., 35-A:132-144, 1953.
6. Holm, C. L., and Embrick, R. P.: Anatomical considerations in the primary treatment of tendon injuries of the hand. J. Bone & Joint Surg., 41-A: 599-608, 1959.
7. Byrne, J. J.: Hand surgery. Am. J. Surg., 88:431-482, 1954.

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President's Letter

WHO WILL BE OUR SUCCESSORS?

The present status and the future prospects of enrollment in our medical schools has been called to our attention by government agencies, economists, and our own national organizations. The quality of the present applicant has given our medical schools concern.

In 1950, 5.1 per cent of college graduates applied for admission. In 1958, the number dropped to 4.1 per cent. "A" grade applicants decreased; a decline in quantitative aptitudes and scientific skills as measured by aptitude tests. Freshman withdrawal during the freshman year increased from 5.5 per cent in 1954 and 1955 to 7.8 per cent in 1957 and 1958. This made fewer students available for the second year.

Aside from the quality student, faculty vacancies in 1957 and 1958 were twice that reported for the period of 1956 and 1957. Twenty medical schools reported an average need of fifty additional faculty members.

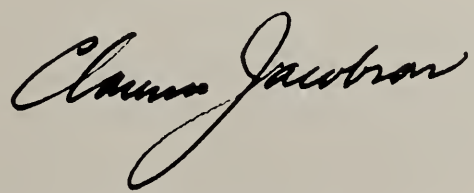
In 1959, there were eighty-six medical schools in the United States including four two-year schools. These would admit 8,250 students in 1960. Expansion and rehabilitation would permit these to admit 9,400 in 1966. It is clearly apparent there is a shortage of physicians and teaching facilities in our country in relation to the present rate of population increase. Assuming that by 1975 there will be 235,000,000 people, 310,000 physicians would be needed to maintain the desired 132 physicians to 100,000 population. At the present time, there are approximately 230,000 physicians in practice and research.

Our situation in Minnesota appears to be fair with regard to selectivity. In 1954 to 1958, there were on the average 316 applicants out of which 130 students were selected yearly. In 1959, there were 319 applicants out of which 137 were selected; 1960 saw 140 selected from 337 applicants.

Among the factors which account for the present decline of qualified applicants are the long years of formal training as compared to other professions. Counting premedical training, up to nine years are required to prepare for general practice and from twelve to fifteen years for the special fields. The increase in the number of married students has become significant. In 1956, 55 per cent, and in 1958, 68 per cent of students in medical school were married. Twelve per cent had two or more children in 1956; in 1958, the number had increased to 24 per cent. These factors loom as economic barriers to many. At best can we postulate that the medical student of today is superior in dedication, stability, and motivation by virtue of meeting these formidable obstacles and overcoming them? Surely, he has additional preparation for better understanding and maturity to fulfill his duty to his patients.

Leaders in medical education are re-evaluating the curriculi and in some schools have succeeded in shortening the period of preparation with the view of maintaining and possibly improving standards.

We, as physicians, can renew our efforts in our local communities to interview and encourage high school students who indicate interest in medicine. Several county societies have organized groups or "clubs" with these young aspirants with success. Our high standards as a profession will be jeopardized if we fail to realize our precarious situation. We must be aroused as individual physicians to act before we are compelled to submit to bureaucratic control.



President, *Minnesota State Medical Association*

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

THE FACTS OF LIFE IN THE FUTURE OF AMERICAN MEDICINE

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I believe that a comparison can be made between the practice of medicine here and the practice of medicine in Great Britain as it was before the National Health Service. There are, of course, differences, but basically it was a system of private enterprise giving, or trying to give, comprehensive medical care.

So this then is to be my theme: To take a look at some of the changes arising as a consequence of the British National Health Service; a look at the attitudes of the patients; an attempt to review the beneficial changes, for there have been many, many good things which have arisen as a result of the British National Health Service. But there are other things that were not expected, that are not so popular and which have led to difficulties for the British physician.

Let me first begin by telling you just what the National Health Service covers. I am sure every one of you knows it covers a complete physician care, at the family doctor and hospital level. Hospitalization covers both in-patient care and outpatient diagnostic procedures. It also covers a lot of other things—dental care, extractions and provisions for dentures. It covers sight testing and provision for spectacles. It covers appliances, even wigs and toupees, if considered necessary for therapeutic reasons.

There are even more things to come. The service provides complete ambulance service. Any sick person requiring an ambulance telephones and is taken to the hospital. It covers the home nursing care of patients who are convalescing or who don't require hospitalization. It will even provide domestic help if a mother is ill and unable to take care of her family. It provides maternity and death benefits. This is literally a cradle to the grave, or, dare I say it, provides care from the womb to the tomb operation.

National Health Service Economics Explained

I would like now to consider the economics of the service. I am sure many people have heard that many doctors in England are dissatisfied with the pay scale. We are also, I think, very dissatisfied with the per capita fee system. By this system, a doctor is paid approximately $3.00 per patient for 24-hour coverage for 365 days of the year. A doctor is permitted to have a maximum of 3,500 patients. Technically, he may have private practice as well, but, as you will see, private practice has diminished to approximately five per cent. There are very few doctors today who live solely by private practice. Thus, if a doctor has a maximum number of patients, which few have, he is hard put to care for 3,500 patients.

A quick translation into American terms, which is made by economists in England and America, shows that if a man carries 3,500 patients, then he will have a buying power equivalent to $8,110 before deduction of taxes and practice costs. That doesn't sound perhaps too much but this puts such a doctor in an income group which is in the top 1.4 per cent of income levels in the country.

The average number of patients is 2,300 and gives a standard of living equivalent to $6,000. If a physician earns this sum of money, then he is in the top 2.5 per cent of the national income group.

The patient pays the equivalent of $1.32 per week, with the employer paying $1.08 and $.90 for men and women, respectively. This averages out 3.6 per cent of the average annual wage, or $140 per year from direct contributions and indirect taxation. All these figures were calculated very carefully and were published in 1958. Over here, on a similar scale, the average earner would pay $186 per year.

The National Health Service takes approximately 10 per cent of the budget. This is a fact which the

public did not realize and is a point which I think is important for people over here to understand. This is that a government can levy charges for a service not only directly by taking a contribution from a person's income, but also by direct and indirect taxation.

Now your taxation per head is calculated at 24 per cent. Our direct taxation is 40 per cent, and is a matter of great embarrassment for the politicians. Of course, the service blossomed and is so expensive that few countries could afford to imitate this, however, I have a feeling that many are trying.

National Health Service Has Long History

How did this service come to be? Is this the product of a communist or near-communist government? Not at all! This service had its inception in 1911, which is when the government started its first compulsory health insurance bill. This was called a National Insurance Act. This provided family doctor care for any worker earning less than $775 a year. All workers and employers had to belong to this system. They had a very good reason when it was first formed, for it was to protect the wage earner. You can see that he received the appropriate care at the necessary time and this would be for the ultimate benefit of the worker's family. But what it didn't do was to provide for the wife and dependents. It also did not provide hospital coverage or specialist consultation. But it did offer free medicine.

When this system came in, the profession was a little skeptical about it, but over the course of the years it was accepted and the medical profession itself recommended in 1930 and 1938 that the scheme be broadened to include the family, and to include consultant, ophthalmic, dental and maternity care.

Then came the war, and of course, all plans went on the shelf. In 1942, a gentleman named Beveridge produced a system of comprehensive coverage. We had a coalition government at that time with Winston Churchill as prime minister. It was Winston Churchill's government which said that as soon as the war ended, "We'll give this broad coverage."

The profession then became a little anxious and negotiations began to take place. In 1944, one of the members of the government proposed a full-time salaried hospital service with the doctor working for the local city authority. This, of course, was rejected outright. But both parties, both the conservative and labor parties, when they went to the polls in 1945 had as their platform a comprehensive medical scheme. Both were committed to introducing such a service.

Well, as you know, it was the Labor Party, the left wing, that was elected and they announced quite arbitrarily that whatever the profession felt, they were going to introduce their scheme on July 5, 1948. This was announced in 1946.

Well, there was tremendous hustle and bustle in the profession, everyone running in different directions and taking different viewpoints. A referendum was taken and only 17 per cent of the profession were willing to join such a service. We said to the government, "How can you work such a scheme if you have no doctors? You have only 17 per cent."

Divide and Conquer Technique Used

The man in charge, Aneurin Bevan, said, "I don't care. I'm going ahead."

This is how they started that old government maneuver, "divide and conquer," which I am sure is applicable here as well as in other countries. He said, "If a doctor joins now, we will buy his practice and the good will. Secondly, we will give him seniority in the service. And thirdly, we will give full pension rights after ten years in the service."

The older men who were looking toward retirement felt that as an inducement to join the service. There was leadership; plenty of voices were raised, but there was no unanimous voice. A second referendum was taken and 49 per cent of the profession signified they would take part in this scheme. The government said, "We have 49 per cent, so we are going ahead." This they did, and by 1948 they had sufficient practitioners to initiate the service.

Image of General Practitioner Changes

At this point, I would like to switch to the second part of my presentation. You have heard it said that I am a psychiatrist. When people ask what I am, I tell them I am a physician. If they press me, I say I deal with mental diseases. This reminds me of a story of the school teacher who was asking her pupils what their fathers did. She came to one little boy and said, "What does your father do?"

He said, "My daddy plays the piano in a burlesque house."

She didn't think this was a very good moral background for the boy, so she arranged for a visit to his home. She found he had an address in a very fashionable suburb of the city. It was a beautiful house. When she rang the bell, a maid answered. She said, "I would like to see Johnny's father." The maid showed her into a library, where a distinguished looking man met her. She said, "Good gracious me! You're not a bit like what I had expected. Your son, Johnny, said you played piano in a burlesque house."

He said, "Well, actually, I'm a psychiatrist, but I haven't the heart to tell the boy."

Now I want you to imagine that I am not alone on this platform today. On my left I have Dr. X, who is a general practitioner from the days preceding the National Health Service. On my right I have Dr. Y, who is a general practitioner in the National Health Service. I am going to ask them to tell you their likes and dislikes.

Let me first diverge, however, and say that 85 per cent or thereabouts of our profession is in general practice. The rest are specialists. If a patient wished to have a specialist consultation, he usually went through the recommendation of his general practitioner.

Now let's call on Dr. X. He is a well set up gentleman. He has a good suit, a nice car, not the equivalent Cadillac, or a Chrysler, or Lincoln, but it is a good car and it is paid for. He tells you that one of the things he likes about the practice of medicine before the National Health Service is, first, that he can practice where he pleases. I am sure it is the same here, that a man has a choice of a resort area or a country practice where perhaps there are more difficulties in getting started and when you are established there is less income but life is very pleasant. Or one can go into an industrial community where there are always more patients than doctors—where one can recover the cost of one's education quickly and have a fairly high standard of living even though you don't have time to enjoy what you make.

Now this is very comforting because a man knows that whatever he chooses he can change his location. As a doctor becomes older, he may have a cardiac condition and want to take life easier. Dr. X will tell us he knows he can sell his practice and buy a practice at a seaside resort or in the country. This is very comforting for him.

The other thing he likes is the clinical freedom. He is responsible to his colleagues and his conscience and his patients—nobody else. Since all the specialists are dependent upon him for referrals, he is well considered by the specialists. His opinion is solicited. He is encouraged to put a patient in the hospital and take care of him—with the help of the appropriate specialist. This was a very, very nice arrangement. An interesting patient could be admitted to the hospital and the general practitioner could prescribe appropriate treatment. He could take holidays when he liked and, of course, like all doctors, he enjoys a very comfortable status in the community. He could be a civic leader and be very respected. People would solicit his opinion on many things outside medicine.

The things that Dr. X doesn't like are the cost of drugs and the cost of hospitalization for a patient who doesn't have much money. He didn't like, I think, the fact that he would like to make more visits with certain patients but financial circumstances precluded this. The other difficulty was that our specialists were dependent upon private practice and they had to be located around the large cities and teaching hospitals.

There were problems in neuro-surgery or thoracic surgery, especially from trauma, when it might not be possible to get an appropriate specialist, except by transporting the patient to a bigger center.

How about Dr. Y? He doesn't look quite as happy. He looks harassed. Let's ask him to tell us what he likes and what he doesn't like.

The things he likes are that now there is a comprehensive system providing medical care for all people regardless of social and economic status. This is very comforting. He likes the fact he can visit as he wishes. And he likes the annuity scheme whereby 6 per cent of his income and the equivalent of 8 per cent from the government are put together to provide an annuity when he retires.

One of the things he dislikes is the fact that he no longer owns his own practice. He dislikes the fact that he has difficulty in practicing where he chooses. We have more doctors applying for vacancies than there are vacancies available. A doctor, whenever he reads of a vacancy, may put his name forward, but there may be as many as thirty doctors competing for that one vacancy. If he is in an industrial center and would like to switch to a country practice, it can be difficult. Transfers can be made, but with nowhere near

the same ease as before the inception of the service.

And another thing is that when the doctor is older, the National Health Service Authority, consisting of predominantly non-medical people, and responsible for appointing that doctor, may look at the problem differently and say, "We want a young doctor, one who will be able to practice for a few years to come." This also makes it very difficult for the older man to transfer.

High Taxes Force Use of National Health Service

There is, of course, the question of private practice. The government paid lip service to the fact that private practice could co-exist with the National Health Service. But there is one restriction that has caused a lot of heartburn in the profession. Although everybody belongs to the service, if a person comes to you as a private patient, any drugs that you prescribe for the patient he has to buy himself. You know very well the cost of antibiotics, and in the case of a serious illness this can amount to a tremendous sum of money. Therefore, this has been a very great deterrent against people consulting a physician privately.

High taxation has meant that middle income groups and even upper income groups have had difficulty meeting their taxation and therefore they come to the doctor and say, especially when they wish to educate the children: "Doctor, I have been a patient of yours for a good many years. We have always been good friends, but I am afraid I am going to have to go on the service." You understand the position, of course, and so another patient is lost to private practice.

You heard me say that the average doctor is in the top 2.5 per cent of income bracket and yet you will recall that the physicians in Great Britain agreed to strike. A tremendous percentage, I think 70 per cent, agreed to withdraw from the service.

Now we, as a profession, tend to be conservative and a strike is very distasteful. Yet so strongly did physicians feel about it. Why? Because when the government came into power they gave assurance with a rise in the cost of living there would be an increase in the remuneration. But the cost of the service was so great that the government said, "We can't afford to pay you more." Our claims have been put off and put off by successive governments, who say "A decision taken by a previous government cannot be binding upon us today."

When we agreed to withdraw from the service, the government met the situation in a very skillful manner. They said, "We will give an immediate 10 per cent raise to all interns and residents." Since they earn the equivalent of $90 a month, this wasn't much. And they said, "We will submit the claims of the profession as a whole to a Royal Commission." A Royal Commission takes up to three years to sift the evidence and present its findings.

Immediately, those in the profession who found the strike distasteful said, "Well, the government is doing something. Let's cooperate and wait."

So another three years have gone by, and here we are on the eleventh year. There have been some adjustments, but the adjustments have nowhere near equalled the rise in the cost of living.

Government Medicine Curbs Incentive

Another thing is that such a scheme destroys incentive. No matter how few patients you see, your income is the same. As far as the patient is concerned, no matter how often or little they attend, the charges which they pay are the same. So this has led to a number of abuses.

In 1958, the profession took stock of the service after ten years. They found that a number of good things had happened.

There was a dispersion of specialist services and an upgrading of hospitals. All hospitals were given an adequate number of consultants. The men were very well qualified and every town and every city had its complement of specialists. This means, from a doctor's point of view, he can refer a patient to any hospital and know that patient will get very competent, efficient care.

Another thing is that it is a comprehensive medical service.

Some very unusual things have happened, however, and I am sure the same sort of thing could happen over here.

In the first three years of the service, in a country of forty-eight million people, there were 609 million prescriptions and drugs issued. Seven million sets of dentures were issued. Seven hundred thousand appliances were issued. Of course, the cost just skyrocketed. The government was embarrassed and didn't know what to do. So they had to impose restrictions. They said you must pay a shilling on a prescription. A shilling is approximately 14 cents.

You would pay up to a maximum of $2.80 if you went to a dentist for a tooth extraction.

You would pay $4.20 towards the cost of spectacles.

You would pay $12.00 towards the cost of dentures.

And, of course, the actual deductions from the payroll also increased. So the consumer, the patient, John Q. Public, as he is referred to in another presentation, was paying through direct deduction from his payroll and also by heavy direct and indirect taxation.

To give you an example of the indirect taxation, we had a sales tax as high as 66 per cent on automobiles, and a tax of 50 per cent plus on luxury items, such as all electrical appliances, ice boxes, television sets, furs, jewelry, cameras—a tremendous sales tax. So you see, the patient is paying a tremendous sum of money for the service, and unfortunately, I am sure this is your dilemma, too. The public doesn't view things in a long-term way.

Elective Surgery on "Waiting Line" Basis

In 1956, the cost of bottles for giving away the free medicines was $2,800,000. And the money spent on research in mental health was approximately $200,000.

I am sure you have heard that 500,000 people are waiting for elective surgery, and they are still waiting, tonsillectomies and things of that kind. For that, one has to wait.

Another thing, no new hospitals were built. We had suffered, of course, because a number of hospitals had been destroyed in the blitz during the war. There was an urgent need. The population has expanded. But no new major hospitals were built. And I learned last Saturday through a BBC (British Broadcasting Company) presentation, that not since 1870 has so little money been spent upon the construction of hospitals.

Now, how has this affected the status of the individual physician? I am sure it is a point of great interest to you all. Doctors, of course, have now had a greater number of patients to take care of, or at least a greater number of visits by patients. This means in order to see everyone a doctor has had to treat, I am afraid, the disease rather than the patient.

Now the treatment and diagnosis have been thorough and efficient. But if you have twenty to thirty or even forty patients in the office you don't have time to talk about little Willie's scholarship to the university or grand-dad's corns, or what is going to happen when the patient's teen-age daughter marries Joe Bloak down the street. You have to treat the disease. You do not have time to give the patient the sort of contact that you had before the service. I think now, especially with young people, this is a problem. I spent time in different types of general practice in three locations. I think that the younger people now tend to regard the doctor as a man whose services have been paid for; therefore, if a patient feels he needs to be seen, whether for a headache or for aspirin, or he needs to take time off from work and wants a sick note, he will come to the doctor. He knows the doctor is being paid and he believes he has the right to see the doctor. If the doctor is busy, that's too bad. He says, "Doctor, I come once a year. You think it is not important. Nevertheless, I am not a doctor and I want to consult you."

MD Has the Role of a Government Servant

The physician is regarded more now as a government servant. I think this inevitably is going to have an effect upon the caliber of men entering the profession. I am very proud to belong to the British medical profession. I think you are all aware that our standards are as high as anywhere in the world and the individual caliber of the men is very high. But one thing that has come out is that fewer and fewer physicians are persuading their sons to enter the profession. I think this is very revealing.

Of course, the status of the physician's wife has inevitably been altered because of the fixed income, and with the private practice diminished, a doctor can't afford to have all the help he would like. Therefore, more and more wives are assisting their husband-physicians.

Another thing that has happened, which I am sure is very serious, is that the control of the profession has now moved out of the profession. Before, a man was responsible to the General Medical Council. This was composed of his colleagues nationally elected who would deal with any matters of discipline or ethics.

Now he is responsible to a National Health Tribunal and National Health Executive Council. The GMC is still there, but the things that affect a doctor's livelihood and independence and right to practice are now under direct government control. A doctor can be reprimanded or suspended

from the service for a deficiency which is not medical. If a doctor consistently misplaces his National Health Service records he will be reprimanded. If it continues, he can be suspended from the National Health Service. And you can imagine what it will entail.

Dispensing of Drugs Limited

All prescriptions are checked at routine intervals, and if it is found that one doctor is consistently prescribing more than his colleagues in that area, he will be called to account to the appropriate National Health Service body for this so-called over-prescribing. If they find he has been over-prescribing, this money is deducted from his remuneration.

The other thing that happens is that there are certain items that fall into the no-man's-land of drugs or food. I am thinking of patients who have liver damage. Certain preparations are challenged as a food, and the practitioner is told: "This is not to be given under National Health Service. Therefore, we are deducting the cost from your remuneration." He may appeal, but the appeal may have to go all the way through the National Health Service channels.

Now, will it happen in this country? Your guess is as good as mine, and I believe your feeling of the tenor of the situation in America is greater and better than mine.

U. S. Reaction toward Government Medicine is Cause for Alarm

I want to tell you of one thing that astonished me recently. At a meeting in the United States, I heard speak Mr. Hugh Gaitskell, the leader of the British Labor Party, who would have been the Prime Minister had his party been successful in the last election. He addressed an open meeting of middle class people. During the question and answer period, inevitably the question came up, "What is your opinion of the socialized medicine you have in Great Britain?" And his answer was very fluent and elicited what, to me, was an astonishing reaction from the audience.

He replied, "We don't call it socialized medicine. That's what it is called over here. We call it the British National Health Service and if you want my opinion, I consider it the greatest social reform in the history of the British House." He received spontaneous applause from that audience. It may seem naive, but I was astonished and very surprised. The significance of this I will leave to you.

We have the Forand Bill and we have other areas that you are all aware of, where the Federal Government is making inroads but, as I say, I believe this can be understood better by you and your colleagues.

U. S. Can Benefit from Great Britain's Mistake

In conclusion, where did we go wrong? First, we had no organization to meet the government on the same ruthless footing. They used the technique, and I am sure you are aware there is a probability of that here, which is, "Divide and conquer." They divided the profession. One deal for the specialists and another deal for the practitioner, all the time chopping the profession into groups and sub-groups. Although everybody was protesting, there was no one unanimous voice.

Secondly, and I wonder if it is applicable here, is the lack of public support. We tried to rally the people. Although, individually, they had a tremendous liking and respect for the physician as a person, I think in every country there is something of envy for the profession as a whole. I notice here when I go into a shop to buy something, I get this reaction: "Doctor, this is our standard line. You don't want this. You want the deluxe model." Which is three times as much. This is a very unfortunate attitude for the public to have.

We had special conditions that I think were peculiar to Great Britain. We had just emerged from the war. Many physicians had returned from overseas. They were starting a family and they wanted to get out and practice and they didn't take the threat seriously.

I think if we could go back we would have adopted a policy of trying to effect a compromise favorable to us. One which would enable us to give the patient the type of care that we think he needs and deserves and the type of care that can be made possible under our control.

We were warned. We had a long period of warning. We saw it coming and we didn't react to it.

Government Medicine Means a Road of No Return

Will it change? No. Politically, it is dynamite. A politician concerned with getting back into Parliament or Congress or the Senate is not going

to vote for something that the public is against and that is why I don't think our own system will change.

I would like to finish with this thought: The scheme has a lot of very good points; it has a lot of things which make it unpopular with the physician, with the patient and the politician, each for a different reason. Somebody said on the BBC film which I heard last Saturday, "Everybody points the finger and says, 'What a wonderful scheme it is,' but no country yet has felt wealthy enough to introduce the scheme as we did in one slam-bang." But a lot of countries are introducing it piecemeal, and in the Commonwealth and Canada they have schemes of various sorts. Also in Australia, New Zealand, Germany, Italy and the Scandinavian countries. It is coming, not with one move, but piecemeal, and I think it seems inevitable.

Therefore, we have to meet the challenge and give something to the patient which is good for him and good for us.

I think you have in prepayment medical plans an effective challenge to government sponsored health insurance. Over the last few days, I am also aware that there are difficulties with these, both from the patient's and the physician's viewpoint. I urge you to resolve these difficulties.

Why do I say that prepayment medical insurance is an answer to government intervention in the medical field? Simply this, over the last few years in the United Kingdom, over four million patients who belong to the service have voluntarily taken out private prepayment medical insurance. This means they are paying yet again to recover something which they feel is worth having.

The British National Health Service has succeeded because of the integrity of the British physicians who made it work despite their own feelings. The private insurance is expanding rapidly, because the British physicians also want it to work and we are making every effort to see that it does.

I believe, therefore, that prepaid medical insurance, especially the type offered by Blue Shield, will be one answer to the situation which you have here in America.

The future rests in your hands.

Woman's Auxiliary

YOUR COUNTY AUXILIARIES IN ACTION . . .

Ramsey County

Dr. William Lick spoke on Blue Cross and Blue Shield at the March meeting held in the Minnesota Club. Chairman of the St. Paul Heart Council, educational division of the Heart Association, is Mrs. Herman Wolff. This group promotes the distribution of educational material in the form of lectures, films, and talks by doctors for lay groups. These programs will be available for civic and PTA groups. At the April meeting of the Ramsey County Medical Auxiliary held in the Women's City Club, Mrs. Wallace Gleason presented checks to the winners of the Medical Society's essay contest on free enterprise. Mrs. John Teisberg gave awards to the winners in the radio speech contest on tuberculosis sponsored by the Auxiliary. Mr. and Mrs. Henriot of the Theater St. Paul gave an extremely interesting program. They traced different types of acting from the time of Shakespeare to the present day and presented excerpts from plays by way of illustration.

Mower County

The Mower County Medical Auxiliary sponsored a medical career day, April 4, at the YWCA in Austin. About sixty-five girls from Austin High School and other high schools throughout the county were present.

Mrs. Thomas Seery, president, introduced Mrs. Mansur Taufic who presented panelists as they discussed opportunities in the various medical fields.

Miss Edna Gjermundson, industrial nurse at Geo. A. Hormel & Company, explained her field; John Brenner, St. Olaf Hospital anesthetist, outlined opportunities in anesthesia; Mrs. Darrel Yates, Mower County public health nurse, discussed public health nursing, and Mrs. Taufic, who moderated the panel, stressed the opportunities in the field of nurses' education. A question and answer period followed.

Blue Earth County

The Blue Earth County Medical Auxiliary has as its chief interest the nursing school of the Mankato State College and the Mankato Rehabilitation Center. The Auxiliary has purchased a tape recorder for the use of the Center in speech therapy and is considering a request for volunteer time to assist at the Center. Members have voted $180 tuition scholarship for a student nurse at the nursing school. They continue their support of AMEF drug collections.

McLeod County

The McLeod County Medical Society and Auxiliary entertained members of the McLeod County Bar Association and their wives at a dinner meeting at the Garden Supper Club in Hutchinson recently.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

IMAGE OF A PHYSICIAN IN A PATIENT'S MIND'S EYE

What does a patient see in his mind's eye when he thinks of medicine? The medical profession must have the answer to this question before it can effectively develop a sound public relations program.

Business and industry intent to learn what the public thinks have conducted "image" programs.

AMA Communications Director Leo E. Brown explains simply put, an image program is what the customer sees in his mind's eye when he thinks of medicine. He sees the sum total of his own and his family's experiences. Blended with this experience is that which he has read, heard or seen of other people's medical experiences. He sees medicine or his own physician in terms of the psychological and emotional impact he has experienced. This image may be real or imaginary; nevertheless, it is his—and his thoughts, words and actions are based upon this image.

Therefore, before we can develop an effective public relations program it is important that we see ourselves as others see us . . . that we use this information to guide us in determining what part of the mirror needs our attention so that the true image of medicine may be reflected to all America.

Recently the public opinion technique was used by the AMA to determine what people are thinking of the medical profession.

Mr. Brown enumerates the results of the survey which included 1500 personal interviews conducted among a representative cross section of the United States twenty-one years of age and over.

Doctors stand higher on the scale of public favor than do any of fifteen other occupational groups.

Doctors overshadow all other groups when people were asked to name the one occupation they regard most favorably.

Next the AMA attempted to ascertain the image of the physician in general in contrast to two other professions—dentists and lawyers—who charge on a fee-for-service basis.

In the area of human relations, physicians outranked the other two professions in: treating each person as a human being; understanding; warmth and friendliness.

But they also outranked the dentists in: not caring about people's feelings; being too impressed with their own importance; acting as though they know everything.

Quite another image was reflected from the public screen in the service area. While 45 per cent gave physicians credit for "nearly always glad to help when you have an emergency," 22 per cent felt doctors were too busy to give each person full attention, 15 per cent felt doctors make people wait unnecessarily for service, and the same number felt that doctors were too difficult to see. While in the favorable category physicians outranked dentists and lawyers—they also had more unfavorable comments chalked up against them.

A lack of satisfaction with service, as distinct from medical care, is definitely one of the public images that needs polishing.

In the area of financial relations, there are some obsessed with the reflection of a dollar sign which represents their image of medicine. While 35 per cent of the general public sees the doctor in a favorable light insofar as financial relations are concerned, we find 18 per cent who have mixed feelings, and another 18 per cent who are critical. Despite the fact that the physician still outranks the dentist and the lawyer, he is criticized for: often charging more than expected; making more money than he is worth; not understanding people's money problems—and, being interested mainly in making money.

In general, the problem here is one of communications and the resultant lack of understanding. Because of this misunderstanding, there is a close association be-

tween the idea that doctors are too money-minded and that their charges are higher than expected.

The public image of the doctor is certainly far from all bad. In a relationship that is so close and personal, it was rather amazing to find that 56 per cent of those interviewed reported no unsatisfactory experience with a doctor. Of the 44 per cent who had an unsatisfactory experience, 32 per cent reported that the experience was of such a nature as to prompt them to change doctors.

This analysis revealed three major areas of dissatisfaction—service, communications and finances. The individual physician, therefore, has a very real obligation to the profession to do all within his power to maintain high quality service, to take the time to discuss with the patient his physiological well being, and to impress upon him his sincere interest, plus a frank discussion of the cost involved.

Another phase of our survey was designed to measure the public image of the American Medical Association. Seventy-one per cent of the general public have heard about the AMA. Of this number, 12 per cent know a fair amount about the Association, 22 per cent know a little about the AMA, and 37 per cent have heard about the AMA but know practically nothing about it.

Among those who have heard of the AMA, 63 per cent feel the AMA encouraged the development of new drugs and medicines, in contrast to 3 per cent who feel the Association is slow to encourage the development of new drugs.

Fifty-seven per cent feel the AMA encourages the development of new methods of treatment, while 4 per cent feel it is slow to encourage the development of new methods of treatment.

Fifty-five per cent feel the AMA does everything it can to further health education.

In the field of legislation, 42 per cent feel the AMA supports desirable laws, while 5 per cent feel we do not.

Traditionally, criticisms have been leveled against the AMA for not doing everything it could to encourage an adequate supply of doctors. Now 33 per cent feel we do and 5 per cent feel we try to limit the supply of doctors.

The difference between the positive approach and the negative is considerably reduced when we asked whether the AMA tries to see that everyone, regardless of ability to pay, gets good medical care, 27 per cent saying yes in contrast to 15 per cent saying no.

In the area of medical leadership, the AMA is given credit for having done most to improve the nation's health, although the total vote for government, including state health departments, U. S. Government and city health departments, exceeds slightly that given to the AMA.

The picture is not nearly so encouraging when asked "Who will take the leadership in the future in advancing the nation's health?" The AMA still is out in front, but the opinion that the U. S. Government *will* lead doubles from that expressed on present leadership (9 per cent to 18 per cent). The reasons given here are logical since the U. S. Government has the necessary authority and the financial means to do the job. But in the field of competency, the AMA leads the U. S. Government 57 per cent to 8 per cent.

There is much cause for concern when we view the present and future leadership image of the AMA and the U. S. Government. Strong evidence of people's increased reliance on government is fairly well documented. However, the situation is far from hopeless, for with the present leadership advantage organized medicine now holds there is no reason why this position of leadership cannot be maintained, providing medicine is willing to promote an effective public relations program in the interest of the general public.

Effective medical public relations can no longer be viewed solely as a preventive or holding operation but as a creative, organized activity to strengthen the future of medicine.

The physician is, has been and always will be medicine's severest critic. This is as it should be, providing it is constructive and not destructive.

All too often we lament the fact that there is an organized effort "afoot" to discredit medicine, to soften us up, so that the Federal Government can step in and socialize medicine. This may be true, I do not know, but if it is, the best way to counteract it is not by playing the martyr role. If the chips are down and the lines are drawn, then let us mobilize the full strength of a noble profession for an aggressive, positive attack, concludes Mr. Brown.

Committee Action

COMMITTEE ON MATERNAL HEALTH

Suggested Guide for Obstetric Hospital Practice

An ounce of prevention is especially worth a pound of cure in obstetrics. A ten-year study of maternal deaths in Minnesota has formed the framework for this suggested guide for obstetric practices. All physicians caring for pregnant women must read carefully.

Foreword

A Maternal Mortality Study Committee appointed by the Council of the Minnesota State Medical Association has been engaged for ten years in a continuous study of every reported and otherwise discovered maternal death in the state. The Committee has carefully analyzed the cause of death in each case and has attempted to evaluate objectively the deficiencies of prepartal, intrapartal and postpartal care which might be considered to be contributory factors.

Reports of the Committee's findings and conclusions have been published from time to time in MINNESOTA MEDICINE (see references).

Based on this study and on these reports, the Committee has drawn up a set of carefully considered suggestions for maternal care which have been reviewed and approved by the Maternal Health Committee of the Minnesota State Medical Association, by the Minnesota Chapter of the Academy of General Practice, and by the Minnesota Obstetrical and Gynecological Society.

The Council of the Minnesota State Medical Association, on December 20, 1959, approved the organized set of recommendations which follows as a suggested guide for obstetric hospital practice and has authorized its distribution to physicians and hospitals in the state by the State Board of Health. The Council has authorized its publication in MINNESOTA MEDICINE, so that the principles it embodies may be brought to the attention of all Minnesota physicians.

The Committee offers it as an aid in formulating modern standards for the hospital practice of obstetrics which it believes would appreciably reduce the state's present low maternal mortality rate.

JAMES J. SWENDSON, M.D.,
Chairman,
Committee on Maternal Health

Suggested Guide for Obstetric Hospital Practice

As Recommended by the Committee on Maternal Health and Approved by the Council of the Minnesota State Medical Association

It became increasingly evident after the first five years of the Minnesota Maternal Mortality Study that one way in which the number of maternal deaths still considered preventable could be reduced was by the adoption of relatively uniform standards of obstetric practice by hospitals throughout the state.

The following recommendations are not offered as a complete manual of obstetric practice, but are designed as a concise, available, and practical guide in the areas which the Committee considered to be the source of most of the preventable obstetric mortality and morbidity.

1. Prenatal Care and Records.—

The first prenatal visit should include:

(1) An adequate history and general physical examination.
(2) Pelvic mensuration and evaluation by estimating the transverse diameter of the outlet and the diagonal conjugate of the inlet, and by palpating the pubic arch, the sacrum, and the ischial spines.
(3) Laboratory work-up consisting of a serologic test for syphilis, the determination of hemoglobin or hematocrit, a urinalysis, an Rh determination, and blood typing.
(4) A routine chest x-ray, or a Mantoux test, when practical.

Subsequent prenatal visits should include:

(1) Blood pressure determination.
(2) Urinalysis, at least for albumin.
(3) Weight determination.
(4) Hemoglobin determination, at least once during each trimester.
(5) Abdominal palpation and auscultation of the fetal heart tones during the last two months of gestation.

(6) An adequate follow-up and study of any abnormalities discovered.
(7) Rh antibody titers early in pregnancy and at four to six weeks before the estimated time of delivery on Rh negative patients unless the husband is known to be Rh negative.

2. Hospital Work-up and Records.—

(1) A copy of the essential information from the prenatal record should be made a part of the hospital record and should be available at the time the patient is admitted to the hospital.
(2) Adequate evaluation of the patient's history and physical condition should be made and recorded as soon as practicable after admission.
(3) The hospital record should include pertinent progress notes, a summary of the condition of the patient on discharge, and a final diagnosis.
(4) All orders for treatment should be signed by the physician.

3. Obstetric Consultations.—

(1) Liberal use should be made of consultation. Competent consultants should be selected who have one or more of the following qualifications:
   a. Board certification or the qualifications for certification.
   b. Activity in the practice of obstetrics and full hospital privileges to perform gynecologic surgery.
   c. Recognized ability as an obstetrician in his own community.

(2) Consultation is suggested for.—
   a. Prolonged labor.
   *b. Contemplated forceps delivery above the level of outlet forceps.
   *c. Tranverse, face, compound, or other abnormal presentations.
   *d. Primiparous breech presentation.
   *e. Multiple pregnancy.
   f. Severe toxemia of pregnancy.
   *g. Contemplated termination of pregnancy by cesarean section.
   h. Obstetric hemorrhage before, during, or after parturition.
   i. Other serious complications or complicated diagnostic problems.

4. The Use of Pituitary Extracts.—

Pitocin or synthetic Pitocin (Syntocinon) should be used rather than obstetric pituitrin. When these preparations are used before delivery, it is urged that they be administered intravenously in dilute solution as a slowly-running drip. Experience has shown that this route and this method of administration are preferable to subcutaneous or intramuscular administration.

When intravenous Pitocin solution is administered:

(1) Supervision and attendance by the physician are indicated.
(2) The cervix should be soft and at least partially effaced, and it should be dilatable.
(3) There should be no cephalo-pelvic disproportion.
(4) There should be no malpresentation of the fetus.
(5) The concentration suggested is ten units of Pitocin per liter of a solution of 5 per cent glucose in water.
(6) The rate of administration should not exceed 1.5 cc. of the dilute solution per minute (about 25 drops).
(7) During the first one-half hour of administration, the rate should not exceed .75 cc. per minute.
(8) The administration of intravenous Pitocin solution should be stopped or slowed if contractions last longer than 60 seconds or occur at intervals of less than two minutes; also, if the rate of the fetal heart tones is noted to be less than 110 or more than 160 per minute for longer than three minutes.

Note.—Multiparity adds to hazards of the procedure and should emphasize the need for careful control with increasing multiparity.

5. Obstetric Anesthesia.—

(1) Local anesthesia: Its use is encouraged.
(2) General anesthesia (by inhalation or intravenously):
   a. An appropriate dose of scopolamine or atropine should be given before a general anesthetic is begun.
   b. The same equipment as that noted below under "Spinal Anesthesia" should be available when administering a general anesthetic.
   c. A general anesthetic should be administered only under the supervision of an adequately trained person.
   d. A general anesthetic should be administered very carefully to a patient who has taken food or fluids shortly before or at any time during labor.

(3) Spinal anesthesia:
   a. When a spinal anesthetic is administered:
      i. Intravenous fluids should be running through a No. 18 needle.
      ii. Oxygen should be available for administration under positive pressure.

*Attendance by the consultant during delivery should be considered.

iii. Vasopressors should be available.
iv. Adequate suction equipment should be on hand.

b. For cesarean section, the maximum dose of the anesthetic agent should be approximately 75 mg. for Procaine, 8 mg. for Tetracaine or their equivalents for other similar preparations.

c. About one-half of the maximum dosage used for cesarean section should be administered for vaginal delivery.

Note.—Spinal anesthesia is poorly tolerated by pregnant women and dosages should be substantially less than for general surgical procedures.

6. The Observation of Patients in Labor and Immediately Postpartum.—

(1) No food should be ingested during active labor.
(2) In early labor, evalution of the character of the labor should be made, and frequent checks should be made of the patient's blood pressure, of the fetal heart rate, and of the condition of the cervix.
(3) As labor advances, the intervals between these checks should be shortened.
(4) Postpartum, the blood pressure, the height and firmness of the uterine fundus, and the amount of vaginal bleeding should be checked every fifteen minutes for the first hour and every one-half hour for the second and third hours.
(5) The findings of the above observations should be recorded on the chart.

7. The Management of Severe Hypertensive Toxemia.—

(1) Hospitalization is imperative.
(2) Consultation is advised.
(3) Bed rest is indicated.
(4) The restriction of sodium intake is indicated.
(5) The administration of diuretics is indicated.
(6) Vasodilator drugs (which improve cerebral and renal circulation) should be administered for the lowering of blood pressure. Their use parenterally in adequate doses is indicated.
(7) Magnesium sulfate solution intramuscularly, given in doses of 5 grams every four hours, may be used for its sedative and anticonvulsant effect. The administration of magnesium sulfate should be discontinued if the urinary output becomes less than 100 cc. for four hours and/or the patellar reflexes disappear.
(8) Large doses of barbiturates are best avoided because of their action of depressing cerebral oxygenation.
(9) Severe or fulminating preeclampsia which does not respond to the measures suggested above should be treated by induction of labor, if it is feasible, or by cesarean section, if induction is not feasible.
(10) Cesarean section is not indicated during the active phase of convulsive toxemia.

8. The General Management of Obstetric Hemorrhage.—

(1) Blood loss should be replaced as soon as possible with whole blood.
(2) While blood is being cross-matched, one or more intravenous infusions of glucose solution in water should be administered using number 18 gauge needles.
(3) When indicated, plasma expanders, such as Dextran, also may be administered intravenously.
(4) Consultation is indicated.

9. The Management of Postpartum Hemorrhage.—

(1) Prophylaxis: Postpartum hemorrhage often may be anticipated and the proper preparations made for combating it. Blood typing, cross-matching, and the starting of intravenous fluids may be done in advance when such conditions as multiple pregnancy, operative delivery, prolonged labor, the overdistended uterus of hydramnios and uterine inertia alert the attending physician to anticipate excessive postpartum bleeding.
(2) Active management: If preparations have not been made for the patient who bleeds postpartum, the following measures are indicated:
   a. Blood should be drawn for cross-matching and fluids should be started intravenously through a number 18 gauge needle.
   b. Intravenous oxytocics should be given which include the continuous administration of a dilute Pitocin solution.
   c. The placenta should be examined.
   d. The vagina, the cervical canal and the uterine cavity should be explored, but without deep anesthesia.
   e. Any lacerations discovered during examination should be sutured.
   f. Blood loss should be replaced with whole blood.

10. The General Management of Late Pregnancy Bleeding (Antenatal Hemorrhage).—

(1) If there is significant blood loss, intravenous fluids should be started and given through a No. 18 gauge needle while an adequate amount of blood is being cross-matched for blood replacement.
(2) Rectal examination is contraindicated.

(3) Frequent abdominal examinations are indicated and should include:
   a. Palpation for a possible increase in the height of the fundus of the uterus and for increasing tone and tenderness of the uterus.
   b. Auscultation of the fetal heart tones for changes in rate.

(4) When the duration of the gestation is less than 34 or 35 weeks, expectant treatment may be followed for a time if severe premature separation of the placenta can be ruled out by such signs as painless bleeding, a soft, relaxed uterus, a normal fetal heart rate and no increase in the height of the fundus of the uterus. With these findings, the presumptive diagnosis is placenta previa.

(5) If, with the above findings, bleeding subsides, and expectant treatment is decided upon in the hope of increasing the chances of fetal survival, it is advisable to keep the patient in the hospital and to have 1,000 cc. of whole blood available for transfusion at all times.

(6) If, with the same findings, bleeding continues or recurs, vaginal examination (as described below) is indicated even though the presumptive diagnosis is placenta previa and the duration of the gestation is less than thirty-four or thirty-five weeks.

(7) If the duration of gestation is thirty-five weeks or more, or if the estimated weight of the fetus is five pounds or more, and bleeding continues or recurs, a diagnostic vaginal examination is indicated.

(8) Vaginal examination, when indicated, should be done under a double set-up, that is, preparations should be made for immediate cesarean section if it becomes necessary.

(9) An adequate amount of cross-matched blood should be available and a number 18 gauge needle should be in a vein with fluids running before doing a diagnostic vaginal examination.

11. The Management of Placenta Previa.—

(1) If complete or central placenta previa is demonstrated by careful vaginal digital examination, the termination of pregnancy by cesarean section is indicated.

(2) The management of lesser degrees of placenta previa requires judgment. Some cases may require termination of the pregnancy by cesarean section and others may require only simple rupture of the fetal membranes. Choice of the method of treatment should be made by evaluating such factors as parity, the condition of the cervix, the status of the fetus, and the degree of placenta previa demonstrated.

12. The Management of Premature Separation of the Placenta.—

If the history and an examination (including, if necessary, a sterile vaginal examination) lead to a diagnosis of premature separation of the placenta, the following appropriate measures are advised:

(1) Blood should be made available for the replacement of significant blood loss.

(2) Consultation is indicated.

(3) Five to ten grams of fibrinogen should be made available.

(4) *Clot observation tests* should be done hourly, as follows: Five cc. of blood are drawn and placed in a small test tube. At adequate fibrinogen levels, a firm clot forms which does not lyse during a period of thirty minutes. With a critical lowering of plasma fibrinogen, no clot forms. Between these levels, the formation of a soft clot which lyses in less than thirty minutes indicates a serious fibrinogen depletion.

(5) If clot observation tests reveal significant fibrinogen depletion, two grams of fibrinogen should be administered and the dose repeated as shown necessary by hourly tests. This should be done even though the patient is not bleeding.

(6) If the fetus is living and viable, and delivery, as judged by the state of the cervix and the character of the labor, is not imminent, blood loss should be replaced and a cesarean section should be performed.

(7) If the fetus is living and viable, and delivery is imminent, simple membrane rupture should be done and shock should be controlled by blood replacement.

(8) It may be advisable to stimulate labor by instituting an intravenous Pitocin drip after membrane rupture has been accomplished.

(9) If intravenous Pitocin drip is used to stimulate labor, it should be continued postpartum until the danger of hemorrhage has passed.

(10) If the fetus is dead, conservative management is usually indicated:
   a. Rupture of the membranes should be carried out as soon as it is practicable.
   b. The replacement of blood loss should be made.
   c. The institution of an intravenous Pitocin drip may be required to stimulate labor.

(11) If the fetus is dead, radical management with delivery by cesarean section is indicated only on rare occasions in the presence of severe abruptio placentae when the probability of vaginal delivery being accomplished within a reasonable length of time is unlikely.

(12) Every attempt should be made to correct shock before resorting to delivery by cesarean section.

(Continued on Opposite Page)

In Memoriam

HUGH BEALS

Dr. Hugh Beals, a St. Paul physician, died May 2, 1960, at the age of seventy-six, at his winter home in La Jolla, California.

A native of Cumberland County, Illinois, he was graduated from Hahnemann Medical College and Hospital in Chicago and began practicing in St. Paul in 1909. He retired in 1949. He was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by his wife, Kate; a daughter, Mrs. Sarah Holzenbach, and four grandchildren.

CLIFTON A. BOREEN

Dr. Clifton A. Boreen, Minneapolis dermatologist, died May 1, 1960, at the age of sixty.

A life member of the Hennepin County Medical Society and the Minnesota State Medical Association, Doctor Boreen was born in Stillwater, Minnesota. He was a graduate of the University of Minnesota Medical School and was a charter member of the Sigma Nu Fraternity.

Doctor Boreen retired in 1952 after fifty years of practice in Minneapolis. He was a medical officer in World War I; a member of the Mayflower Congregational and AF & AM.

Survivors are his wife, Leilla; and a sister, Mrs. Burke Thompson, Minneapolis.

Committee Action

13. Note on Accouchement Forcé.—
Manual dilation of the cervix for forcible delivery of the fetus is an outmoded procedure fraught with proven dangers, and it should never be done.

14. Note on Internal Version and Extraction.—
This procedure has been shown to be extremely hazardous for both mother and infant, and it has very limited indications and applications.

References

1. Maternal Mortality Committee, Minnesota State Medical Association: Maternal Mortality Study. 1941 Study, Minnesota Med., 27:475; 557; 1944; 1950 Study, Minnesota Med., 36:609, 1953; 1951 Study, Minnesota Medicine, 37:131, 1954; 1952 Study, Minnesota Med., 38:29, 1954; 1953 Study, Minnesota Med., 39:381, 1956; 1954 Study, Minnesota Med. In publication.
2. Rosenfield, A. B.: Minnesota maternal mortality surveys. Am. J. Pub. Health, 43:56, 1953.
3. McKelvey, J. L., and Freeman, D. W.: Critical evaluation of the Minnesota maternal mortality study. Am. J. Obstet. & Gynec., 68:29, 1954.
4. Barno, Alex, Freeman, D. W., and Bellville, T. P.: Minnesota maternal mortality study—Five-year general summary, 1950-1954. Obstet. & Gynec., 9:336, 1957.
5. Freeman, D. W., and Barno, Alex: Hospital and hospital staff responsibility for maternal mortality. Minnesota Med., 41:104, 1958.

THOMAS P. MARTIN

Dr. Thomas P. Martin, Arlington physician, died May 4, 1960, at the age of eighty-six.

Doctor Martin was born in Piper City, North Dakota. At the age of nine he moved to Page, North Dakota, where he received his preliminary education. He graduated from the University of Michigan in 1902.

He served as a captain in the Medical Corps before coming to Arlington in 1930. He was a member and served on the Board of the Arlington Methodist Church and also belonged to the American Legion and the Masons. Doctor Martin was a member of the Scott-Carver Medical Society and was a fifty-year member of the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Hope A., Minneapolis; a son, Dr. Dwight L. Martin, South St. Paul; and three daughters, Mrs. Chester Webb, Cavalier, North Dakota, Mrs. W. P. Laughlin, Elmhurst, Illinois, and Mrs. Lee Christenson, Rochester, Minnesota.

JOSEPH J. McCARTHY

Dr. Joseph J. McCarthy, St. Paul police surgeon for twenty-six years, died April 22, 1960. He was sixty-seven years of age at the time of his death.

He was born in Clinton, Iowa, and attended the University of Iowa. He was graduated from the University of St. Louis Medical School and served his internship at St. Mary's Hospital in Minneapolis.

In 1929 he entered general practice in St. Paul. He was appointed a police surgeon July 1, 1934, and had served in that position since in addition to his private practice.

Doctor McCarthy was a member of the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Surviving are his wife, Florence; a daughter, Joanne McCarthy, Virginia, Minnesota; three sons, Jean J., John P., and Joseph D., all of St. Paul; and two sisters, Mrs. John F. Devlin, Clinton, Iowa, and Alice McCarthy, Riverside, California.

ALFRED E. WALKER

Dr. Alfred E. Walker, a former Duluth physician and surgeon, died April 14, 1960, at St. Joseph's Hospital in St. Paul, at the age of ninety-seven.

Doctor Walker, who practiced medicine in Duluth for sixty-one years, moved to St. Paul in 1951 following his retirement.

The deceased was born in Ontario, Canada, and was a graduate of Western University, London, Ontario, and Bellevue Hospital Medical College, New York.

Doctor Walker was a member of St. Louis County Medical Society and was granted Life Membership in the Minnesota State Medical Association in 1952. He was also a member of the American Medical Association.

Surviving are two sons, Dr. Arthur E. Walker, St. Paul, and Shores A. Walker, Detroit, Michigan. There are four grandchildren and seven great-grandchildren.

Minnesota Blue Shield

The Minnesota medical profession is continuing to lend outstanding support to the program of its Blue Shield organization. In recent months, professional societies and individual participating doctors have demonstrated their loyalty and interest in a truly gratifying manner.

Since January, Blue Shield officials have made a series of appearances before professional groups, including both county societies and those representing specialized fields.

Approximately 30 of these groups have adopted resolutions endorsing the Blue Shield program, with a large number specifically expressing approval of the addition of diagnostic x-ray and laboratory benefits to Blue Shield contracts.

In addition, participating doctors have co-operated in helping to disseminate Blue Shield information to their patients. Many doctors have been enclosing messages concerning Blue Shield in their monthly statements to patients. Blue Shield is providing additional quantities of these messages and it is hoped that doctors will continue to make use of them. This type of personal recommendation by physicians is perhaps the most effective means of maintaining and increasing Blue Shield's enrollment.

The Senior Citizen Plan has also received excellent support from physicians. The literature and application forms which were sent to all participating doctors, along with a placard for displaying the material were well received. Literature and applications for standard Blue Shield contracts are also being sent to participating doctors. It is hoped that the Blue Shield placard will be retained to display Blue Shield literature and applications and that it will be given a permanent place in doctors' offices.

Doctors are also receiving a dignified Blue Shield poster intended for use in waiting rooms. Use of the poster will stimulate interest in Blue Shield and create opportunities for doctors and their office personnel to explain the superior coverage offered by Blue Shield.

Conveying Blue Shield information to subscribers and the public at large remains one of the major challenges of the current program. Confusion and uncertainty about the Blue Shield plan continue to exist.

An intensive program of education and promotion is being carried on to counteract this situation. The foundation of the program is a consistent schedule of statewide radio advertising, in which Blue Shield is sponsoring numerous news programs throughout the day.

Blue Shield has also expanded its use of highway signs throughout the State. A total of 116 Scotchlight signs (8 ft. by 12 ft.) are calling attention to Blue Shield in locations along well-traveled highways.

However, the most effective "advertising message" for Blue Shield is the personal recommendation of participating physicians. It is hoped that the 3,100 doctors of medicine who participate in the Minnesota Blue Shield program will discuss the advantages of this doctor-sponsored plan with their patients at every opportunity.

Members of the doctor's office staff—nurses, receptionists, bookkeepers, business managers—are also in a position to make a valuable contribution to the Blue Shield program. It is hoped that participating doctors will encourage staff members to give patients the facts when patients inquire about Blue Shield.

Pharmacists Support Blue Shield

During its annual convention held in Minneapolis in May, the Minnesota State Pharmaceutical Association adopted a resolution urging members to support the Blue Shield Senior Citizen program.

The Association, representing more than 1,000 Minnesota pharmacists, earlier in May sent Blue Shield literature and application forms to pharmacists requesting that they display this material on the prescription counters of their drug stores.

Henry Moen, executive secretary of the Association, said: "The pressure for government controlled medicine is a threat to all of the health professions, pharmacy included. We pharmacists believe it is our duty to support Blue Shield in its program providing low-cost medical coverage on a voluntary basis."

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A. H. Wells, M.D. ..... Duluth

Medical Advisory

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C. G. Sheppard, M.D. ..... Hutchinson
R. H. Wilson, M.D. ..... Winona

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J. K. Butler, M.D., *Chairman* ..... Cloquet

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V. W. Doman, M.D. (2nd) ..... Lakefield
L. J. Monson, M.D. (3rd) ..... Canby
L. E. Sjostrom, M.D. (4th) ..... St. Peter
A. K. Stratte, M.D. (5th) ..... Pine City
W .W. Rieke, M.D. (6th) ..... Wayzata
W. E. Fitzsimons, M.D. (7th) ..... Brainerd
C. W. Jacobson, M.D. (8th) ..... Breckenridge
J. K. Butler, M.D. (9th) ..... Cloquet

UNIVERSITY RELATIONS

B. B. Souster, M.D., *Chairman* ..... St. Paul
John G. Lohmann, M.D. ..... Pipestone
H. B. Sweetser, M.D. ..... Minneapolis
A. O. Swenson, M.D. ..... Duluth
R. H. Wilson, M.D. ..... Winona

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Counties—Cottonwood, Faribault, Freeborn, Jackson, Martin, Murray, Nobles, Pipestone, Rock, Watonwan.

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P. E. Hermanson, M.D. .....Hendricks
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Counties—Blue Earth, Brown, Carver, Le Sueur, McLeod, Nicollet, Scott, Sibley, Waseca.

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H. T. Petraborg.....Aitkin

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J. V. Carlson.....Westbrook

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G. I. Badeaux.....Brainerd
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H. J. Just.....Hastings
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P. W. Maus.....Dawson

LAKE COUNTY

Ralph Papermaster.....Two Harbors

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W. G. Workman.....Tracy

MARSHALL COUNTY

Carle Holmstrom.....Warren

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C. W. Krause.....Fairmont
H. A. Williamson.....Fairmont
Anthony Ourada.....Fairmont
M. J. Lester.....Truman

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MEEKER COUNTY

Harold Wilmot.....Litchfield
Lennox Danielson.....Litchfield
Fred Schnell.....Litchfield

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Wm. F. McManus.....Princeton

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M. L. Hansen.....Little Falls

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L. F. Twiggs.....Austin
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L. E. Sjostrom.....St. Peter
C. S. Strathern.....St. Peter
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D. A. Limbeck.....Le Sueur

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D. E. Nealy.....Adrian
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NORMAN COUNTY

Byron Kinkade.....Ada

OLMSTED COUNTY

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J. E. Verby.....Rochester
T. O. Wellner.....Rochester

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A. E. Sethre.....Fergus Falls
P. B. Schoeneberger.....Perham
Ralph Estrem.....Fergus Falls
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PENNINGTON COUNTY

M. D. Starekow.....Thief River Falls

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A. K. Stratte.....Pine City

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A. E. Muller.....North St. Paul
O. O. Rollie.....St. Paul

RED LAKE COUNTY

Les. Dale.....Red Lake Falls

REDWOOD COUNTY

W. Alcorn.....Wabasso
W. E. Johnson.....Morgan
S. F. Ceplecha.....Redwood Falls

RENVILLE COUNTY

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C. A. Anderson.....Hector
Leo Furr.....Bird Island

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Bernard Street.....Northfield
Paul G. Bauer.....Faribault

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A. C. Martin.....Luverne
F. W. Bofenkamp.....Luverne
E. S. Boone.....Luverne
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C. W. Jacobson.....Breckenridge
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WRIGHT COUNTY

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R. M. Sandeen.....Buffalo

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Carl Lundell.....Granite Falls
O. M. Odlund.....Granite Falls

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Mrs. J. M. Waugh.....Rochester

County Society Roster

Key to Symbols as Follows:
***Deceased; †Associate or Life Members, and Resident; ‡Military Service;**
§Wife is Member of Woman's Auxiliary; ¶Honorary Member.

BLUE EARTH COUNTY MEDICAL SOCIETY

Blue Earth County
Regular meetings, last Monday of the month
Annual meeting in December
Number of Members—60

President
PENN, GEORGE E.....Mankato
Secretary
SANFORD, RAYMOND A.....Mankato
§ Anderson, James J.....Mankato
§†Andrews, Roy N.....Mankato
§ Batdorf, B. Niles.....Mankato
† Butzer, John A.....Mankato
Butzer, John F.....Mankato
§ Chalgren, William S.....Mankato
§ Conley, Robert H.....Mankato
Dobson, Mervin W.....Mankato
§ Engstrom, Robert B.....Mankato
§ Eustermann, John J.....Mankato
Fortier, Rene G.....Mankato
† Franchere, Frederick W.....Lake Crystal
§ Geurs, Benjamin R.....Mankato
§ Gislason, Paul H.....Mankato
§ Hammar, Lawrence M.....Mankato
Hankerson, Robert G.....Minnesota Lake
*†Hassett, Roger G.....Salona Beach, Calif.
§ Heimark, John J.....Mankato
§ Heller, Edgar E.....Mankato
Hoeper, Philip G.....Mankato
§ Howard, Marshall I.....Mankato
† Huffington, Herbert L.....Lutsen
§ Jones, Orville H.....Mankato
† Juliar, Richard O.....Los Angeles, Calif.
§ Kaufman, Walter B.....Mankato
§ Kearney, Rochfort W.....Mankato
† Kemp, Alphonse F.....Mankato
§†Koenigsberger, Charles G.....Mankato
† Liedloff, Adolph G.....Mankato
§ Lindblom, Alton E.....North Mankato
† Luck, Hilda.....Mankato
Lund, J. Benjamin.....Mankato
Marso, John L.....Mankato
McNear, George R., Jr.....Mankato
Mathews, Wallace E.....Mankato
Meredith, Donald C.....Mankato
§ Mickelson, John C.....Mankato
† Miller, Victor I.....Mankato
§ Morgan, Hugo O.....Amboy
§ Olive, John T., Jr.....Mankato
§ Penn, George E.....Mankato
§ Roth, Frederick D.....Mankato
§ Sanford, Raymond A.....Mankato
§ Scheidel, Alois M.....Mankato
† Schmidt, Paul A.....Aurora, Illinois
§ Schmitz, Anthony A.....Mankato
Setzer, Hobert J., Jr.....Mankato
§ Sjoding, J. Donald.....Mankato
§ Smith, Harry J.....Lake Crystal
Smith, Paul M.....Lake Crystal
§ Snider, Howard R.....Mankato
§ Stillwell, Walter C.....Mankato
§ Swenson, Donald B.....Mankato
§ Thiem, Chester E.....Mankato
† Troost, Henry B.....Mankato
§ Vezina, John C.....Mapleton
§ Von Drasek, Joseph.....Mankato
§†Wentworth, Albert J.....Mankato
† Williams, Hugh O.....Lake Crystal
§ Wohlrabe, John C.....North Mankato

BLUE EARTH VALLEY MEDICAL SOCIETY

Martin, Watonwan and Faribault Counties
Regular meetings, third Thursday of each month
Annual meeting in November
Number of Members—49

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WILLIAMSON, H. A.....Fairmont
Secretary
BOYSEN, HERBERT.....Madelia
§ Anderson, John W.....Blue Earth
§ Armstrong, Ralph S.....Winnebago
§ Barr, James S.....Elmore
Bellomo, John.....Fairmont
§ Bergman, Oscar B.....St. James
§ Boysen, Herbert.....Madelia
§ Bratrude, Earl J.....St. James
† Chambers, Winslow C.....Blue Earth
*†Cooper, Maurice D.....Winnebago
§ Coulter, Harold E.....Madelia
Cullen, Robert M.....Wells
§ Drexler, George W.....Blue Earth
Feigal, William M.....Fairmont
§ Gardner, Jack K.....Fairmont
§ Gardner, Victor H.....Fairmont
Gustafson, Robert W.....Fairmont
§ Halverson, Donald E.....Winnebago
§ Halverson, William G.....Madelia
§ Hanson, Lewis.....Frost
§ Heimark, Julius J.....Fairmont
§ Hruza, William J.....Madelia
† Hunt, Roscoe C.....Fairmont
§ Kraemer, George N.....Fairmont
§ Krause, Carl W.....Fairmont
§ Lester, Malcolm J., Jr.....Truman
§ Lindahl, Merlyn J.....Sherburn
Louisell, Charles T.....Fairmont
§ Mattson, Albert D.....St. James
Mills, John L.....Winnebago
§ Moulton, Keith B.....St. James
§ Nickerson, John R.....Fairmont
§ Nickerson, Neil D.....Fairmont
§ Ourada, Anthony L.....Fairmont
§ Parsons, R. A.....St. James
Parsons, Ralph L.....Trimont
† Rovelstad, Roger A.....Yonkers, N. Y.
§ Russ, Homer H.....Blue Earth
§ Schulz, Robert W.....Fairmont
§ Smith, Don V.....Blue Earth
§ Snyder, Clifford D.....Kiester
§ Thayer, Ellsworth A.....Fairmont
§ Vaughn, Victor M.....Truman
§ Virnig, Mark P.....Wells
§ Virnig, Richard P.....Wells
§ Wandke, Otto E.....Fairmont
§ Watkins, John A.....Wells
§ Williamson, Harold A.....Fairmont
† Wilson, Clyde E.....Blue Earth
§ Zemke, Erhart E.....Fairmont

BROWN COUNTY MEDICAL SOCIETY

Brown County
Regular meetings, quarterly
Annual meeting in January
Number of Members—32

President
KAISER, MILTON L.....New Ulm
Secretary
KITZBERGER, PETER J.....New Ulm
Baker, John H.....New Ulm
§ Black, William A.....New Ulm
§ Boyle, Francis J.....Springfield
Burnett, Joseph W.....New Ulm
Cairns, Robert J.....Redwood Falls
§ Carthey, Frank J.....New Ulm
Dysterheft, Adolf F.....Gaylord
§ Fesenmaier, Otto B.....New Ulm
§ Fritsche, Albert.....New Ulm
§ Fritsche, Carl J.....New Ulm
§ Fritsche, Theodore R.....New Ulm
Goblirsch, Andrew P.....Sleepy Eye
Hovde, Rolf.....Winthrop
§ Kaiser, Milton L.....New Ulm
§ Keithahn, Elmer E.....Sleepy Eye
§ Kitzberger, Peter J.....New Ulm
§ Kruzich, Stephen J.....Sleepy Eye
† Kusske, Arthur L.....New Ulm
§ Muesing, William J.....New Ulm
Nelson, Frank F.....New Ulm
† Nuessle, Walter G.....Springfield
§ Penk, Engward L.....Springfield
Peterson, Roy A.....Vesta
Rimas, Matthew J.....Comfrey
Roan, Morton.....Minneapolis
§ Saffert, Cornelius A.....New Ulm
§ Schroeppel, John E.....Winthrop
Seifert, Otto J.....New Ulm
Sturgis, John A.....Lamberton
§ Vogel, Howard A. L.....New Ulm
Wohlrabe, Donald E.....Springfield
Wohlrabe, Edwin J.....Springfield

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac qui Parle and Yellow Medicine Counties
Regular meetings, 2nd Thursday each month
Annual meeting in December

Number of Members—31

President
CAMP, RAY J.....Madison
Secretary
ANDERSON, CHESTER A.....Madison

Allen, John H.....Montevideo
Anderson, Chester A.....Madison
§ Barr, Ronald W.....Montevideo
§ Boody, George J., Jr.....Sandstone
§ Burns, Floyd M.....Milan
Burns, M. Alpheus.....Milan
† Callewart, Robert A.....Minneapolis
§ Camp, Ray Junior.....Madison
Fallon, Virgil T.....Dawson
Hagberg, Norman L.....Montevideo
§ Hague, Malvin I.....Clarkfield
† Holmberg, LeRoy J.....Canby
§ Hudec, Elwyn R.....Echo
† Hustad, Edward G.....Minneapolis
§ Johnson, Vilhelm M.....Dawson
† Jordan, Kathleen B. Smith.....Granite Falls
Jordan, Lewis S.....Granite Falls
§ Kaufman, William C.....Appleton
§ Lima, Ludvig R., Jr.....Montevideo
§ Lundell, Carl L.....Granite Falls
Maus, Philip W.....Dawson
§ Miller, William P.....Montevideo
*† Nelson, Melvin S.....Granite Falls
Niazi, Suad A.....Granite Falls
§ Odland, Olin M.....Granite Falls
§ Owens, William A.....Montevideo
Pertl, Albert L.....Canby
Radke, Robert L.....Montevideo
§ Roust, Henry A.....Montevideo
§ Schmidt, Paul G., Jr.....Granite Falls
§ Westby, Norval M.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Clay and Becker Counties
Regular meetings, three per year
Annual meeting in December

Number of Members—30

President
WATSON, VIRGIL A.....Detroit Lakes
Secretary
OLIVER, JAMES O.....Moorhead

Bigler, Earl E.....Perham
Bigler, Ivan E.....Perham
§ Bottolfson, Bottolf T.....Moorhead
§ Carlson, Vernon J.....Moorhead
§ Dodds, William C.....Detroit Lakes
§ Duncan, James W.....Moorhead
§ Geib, Marvin J.....Fargo, N. D.
† Hagen, Olaf J.....Moorhead
§ Holten, John.....Moorhead
§ Houglum, Arvid J.....Lake Park
Humphrey, Edward W.....Moorhead
Johnson, Olga H.....Moorhead
Koons, W. R.....Mahnomen
§ Larson, Arnold.....Detroit Lakes
§ Lorentzen, Ernest S.....Detroit Lakes
§ Marsovszky, Paul.....Moorhead
§ Midthune, Andreen S.....Lake Park
§ Moberg, Clarence W.....Detroit Lakes
§ Odland, Mark E.....Detroit Lakes
§ Oliver, James.....Moorhead
† Otto, Henry C.....Frazee
§ Rice, Hagbart G.....Moorhead
Rutledge, John B.....Detroit Lakes
§ Rutledge, Lloyd H.....Detroit Lakes
Saxman, Gertrude E. Olsen.....Georgetown
§ Simison, Carl.....Barnesville
† Thysell, Fred A.....Moorhead
§ Thysell, Vernon D.....Hawley
§ Watson, Robert N.....Detroit Lakes
§ Watson, Virgil A.....Detroit Lakes

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Regular meetings, 2nd Tuesday of every other month of the year
Annual meeting 2nd Tuesday in December

Number of Members—47

President
PETERSON, ALVIN C.....Mora
Secretary
TESCH, GORDON H.....Elk River

§ Adkins, Galen H.....Sandstone
Ahlstrom, Robert C.....Braham
§ Albrecht, Harold H.....Lindstrom
§ Berge, Harry L.....Mora
§ Berglund, Alvin E.....Cambridge
† Bossert, Clarence S.....Mora
Bunker, Bevan W.....Anoka
§ Burseth, Edgar C.....Mora
Corteau, Robert D.....Onamia
§ Deason, Keith B.....Chisago City
† Fryling, Vera B.....Agnew, Calif.
Gailitis, Veronika M.....Cambridge
Halpin, Joseph E.....Rush City
Hall, John J.....Onamia
Henry, Harold W.....Hinckley
Holmes, Alva E.....Rush City
Hovde, Gordon W.....Lindstrom
Huber, Robert W.....St. Croix Falls
§ Hubin, Edwin G.....Sandstone
Johnson, Aldridge F.....Isle
Kapsner, Alfred T.....Princeton
† Kelsey, Carleton G.....St. Paul
§ Larson, Gerald E.....Cambridge
Lewallen, Gene S.....Mora
§ McManus, William F.....Princeton
Mach, Ralph F.....Pine City
§ Magnuson, Raymond C.....Cambridge
Metcalf, Norman B.....Princeton
Nelson, Luther A.....Rush City
§ Nordman, Willard F.....Mora
Nygren, William T.....Braham
§ Peterson, Alvin C.....Mora
§ Peterson, Donald B.....Anoka
Pone, John.....Cambridge
Popovich, Dragojla.....Anoka
§ Roehlke, Arthur B.....Elk River
Schut, John W.....Anoka
‡ Sommer, Robert K.....Markham, Ill.
§ Spurzem, Raymond J.....Anoka
§ Stratte, Alf K.....Pine City
§ Swenson, Roy G.....North Branch
§ Tesch, Gordon H.....Elk River
Textor, Jerome.....Anoka
Vik, Melvin.....Cambridge
† Waller, Joseph D.....Pine City
† Woyda, William C.....Minneapolis
§ Zinn, Charles W.....Elk River

FREEBORN COUNTY MEDICAL SOCIETY

Freeborn County
Regular meetings, third Thursday of even numbered months
Annual meeting, December

Number of Members—36

President
ELLERTSON, L. M.....Albert Lea
Secretary
STEINER, LEON E.....Albert Lea

§ Barr, Lowell C. .....Albert Lea
§ Bartness, John .....Albert Lea
§ Berry, Jack .....Albert Lea
§ Blumer, Arlo R. .....Albert Lea
† Burns, Catherine .....Excelsior
Butturff, Carl R. .....Freeborn
† Calhoun, Frank W. .....Albert Lea
§ Demo, Robert A. .....Albert Lea
§ Donovan, Daniel L. .....Albert Lea
§ Egge, Sanford G. .....Albert Lea
§ Ellertson, Leonard M. .....Albert Lea
§ Erdal, Ove A. .....Albert Lea
* Folken, Frank G. .....Albert Lea
† Freeman, John P. .....Glenville
§ Gamble, Elbert J. .....Albert Lea
§ Gill, Theodore M. .....Albert Lea
† Gullickson, Andrew .....Minneapolis
§ Hansen, Theodore M. .....Albert Lea
§ Holian, Darwin K. .....Albert Lea
† Kaasa, Lawrence J. .....Albert Lea
§ Keil, Marcus A. .....Albert Lea
† Leopard, Brand A. .....Brownsville, Texas
§ Menefee, Edward C. .....Albert Lea
§ Neel, Harry B. .....Albert Lea
Nelson, Charles H. .....Albert Lea
§ Nelson, Clayton E. .....Albert Lea
† Nelson, Wilhma B. .....Albert Lea
§ Nesheim, Martin O. .....Emmons
§ Palmer, Clinton F. .....Albert Lea
§ Person, John P. .....Albert Lea
§ Prins, Leo R. .....Albert Lea
§ Schmidt, Ruben F. .....Alden
§ Sherman, Alfred G. .....Albert Lea
§ Steiner, Leon E. .....Albert Lea
§ Whitson, Sidney A. .....Albert Lea
§ Wilcox, G. Charles .....Albert Lea

GOODHUE COUNTY MEDICAL SOCIETY

Goodhue County
Regular meetings, 3rd Thursday
Annual meeting, December
Number of Members—23

President
HALVORSON, JAMES ..... Zumbrota
Secretary
WASMUND, CLARENCE W. ..... Red Wing

† Aanes, Almer M. ..... Red Wing
§ Ahern, Gene J. ..... Red Wing
§ Akins, Willard M. ..... Red Wing
§ Billings, Harry H. ..... Red Wing
§ Brusegard, James F. ..... Red Wing
Douglass, Jesse E. ..... Cannon Falls
Falls, John L. ..... Red Wing
§ Graves, Richard B. ..... Red Wing
§ Halvorson, James W. ..... Zumbrota
§ Hamilton, Samuel L. ..... Red Wing
§ Hartnagel, Grant F. ..... Red Wing
§ Hawley, George M. B., II ..... Red Wing
§ Juers, Edward H. ..... Red Wing
§ Larson, Oliver E. H. ..... Zumbrota
§ Liffrig, William W. ..... Red Wing
§ Miller, Winston R. ..... Red Wing
§ Molenaar, Robert E. ..... Cannon Falls
§ Sherman, Royal V. ..... Red Wing
† Smith, Myron W. ..... Red Wing
§ Steffens, Leon A. ..... Red Wing
§ Walter, William E. ..... Wanamingo
§ Wasmund, Clarence W. ..... Red Wing
§ Williams, Marland R. ..... Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Hennepin County
Regular meetings, first Monday of each month (Oct. thru May)
Annual meeting, first Monday in October
Number of Members—1102

President
NELSON, MAYNARD C. ..... Minneapolis
Secretary
HOLMBERG, CONRAD J. ..... Minneapolis
Exec. Sec'y
COOK, THOMAS P. ..... Minneapolis

Abramson, Milton ..... Minneapolis
§ Abullarade, Jose A. ..... Minneapolis
§ Adkins, Charles D. ..... Minneapolis
§ Augustsson, Hreidar ..... Minneapolis
§ Ahern, Eugene E. ..... Minneapolis
Alari, Heino ..... Minneapolis
§ Alexander, Harlan A. ..... Minneapolis
§ Aling, Charles A. ..... Minneapolis
† Altnow, Hugo O. ..... Coral Gables, Fla.
§ Amatuzio, Donald S. ..... Minneapolis
Anderegg, Alfred F. ..... Minneapolis
§ Anderson, Arnold S. ..... St. Louis Park
§ Anderson, David M. ..... St. Louis Park
† Anderson, Edward D. ..... Gstaad, Switzerland
§ Anderson, Ernest R. ..... Minneapolis
§ Anderson, Frank J. ..... Minneapolis
Anderson, John A. ..... Minneapolis
§ Anderson, Karl W. ..... Minneapolis
§ Anderson, Richard W. ..... Minneapolis
§ Anderson, Roger L. ..... Minneapolis
§ Anderson, U. Schuyler ..... Minneapolis
Anderson, Wallace E. ..... Minneapolis
§ Anderson, William H. ..... Minneapolis
§ Anderson, William T. ..... Minneapolis
† Andreassen, Einar C. ..... Minneapolis
§ Andreassen, Rolf L. ..... Minneapolis
Andresen, Karl d'A. ..... Minneapolis
§ Andrews, Robert S. ..... Minneapolis
§ Ankner, Frank J. ..... Minneapolis
§ Anonsen, Richard E. ..... Minneapolis
† Arends, Archabald L. ..... Minneapolis
§ Arey, Stuart Lane ..... Minneapolis
§ Arhelger, Stuart W. ..... Minneapolis
§ Arlander, Clarence E. ..... Minneapolis
§ Arling, Leonard S. ..... Minneapolis
§ Arms, James J. ..... Minneapolis
Armstrong, Byron H. ..... Hopkins
§ Arnesen, Paul M. ..... Minneapolis
Arnold, Ann W. ..... Minneapolis
Arvidson, Carl G. ..... Minneapolis
Azad, A. M. ..... Minneapolis
§ Baggenstoss, Osmond J. ..... Minneapolis
§ Bagley, Russell W. ..... Minneapolis
§ Baird, Joseph W. ..... Minneapolis
§ Baken, Melvin P. ..... St. Louis Park
§ Baken, Melvin P., Jr. ..... Minneapolis
Baker, Abe B. ..... Minneapolis
† Baker, Alfred T. ..... Minneapolis
§ Baker, Milton E. ..... Minneapolis
Bakke, Arnold C. ..... Minneapolis
§ Baleisis, Peter ..... Minneapolis
§ Balkin, Samuel G. ..... Minneapolis
§ Balogh, Charles J. ..... Minneapolis
Bank, Harry E. ..... Minneapolis
§ Barnett, Robert M. ..... Minneapolis
§ Barno, Alex ..... St. Louis Park
§ Barr, Maxwell M. ..... Minneapolis
Barr, Robert N. ..... Minneapolis
Barron, Jesse J. ..... Minneapolis
†§ Barron, Moses ..... Minneapolis
§ Barron, S. Steven ..... Minneapolis
§ Beach, Northrop ..... Minneapolis
Bedford, Fred G. ..... Minneapolis
§ Beirstein, Samuel ..... Minneapolis
§ Beiswanger, Richard H. ..... Minneapolis
§ Bell, Donald C. ..... Minneapolis
† Bell, Elexious T. ..... Minneapolis
§ Bellville, Titus P. ..... Minneapolis
§ Belzer, Meyer S. ..... Minneapolis
Benesh, Louis A. ..... Minneapolis
§ Benjamin, Edwin G. ..... Minneapolis
§ Benjamin, Harold G. ..... Minneapolis
§ Benjamin, Robert B. ..... St. Louis Park
Berg, Clinton C. ..... Wayzata
Berger, Alex G. ..... Minneapolis
§ Bergh, George S. ..... Minneapolis
Bergh, Solveig M. ..... Minneapolis
§ Berglund, Eldon B. ..... APO—San Francisco, Calif.
§ Bergquist, James R. ..... Minneapolis
§ Berkwitz, Nathaniel J. ..... Minneapolis
Berman, Reuben ..... Minneapolis
Bernstein, Irving C. ..... Minneapolis
§ Berris, Harold ..... Minneapolis
§ Bessesen, Alfred N., Jr. ..... Minneapolis
§ Bevis, William D. ..... Minneapolis
Bieter, Raymond N. ..... Minneapolis
§ Bilka, Paul J. ..... Minneapolis
§ Binder, Manuel R. ..... Minneapolis
§ Bittick, Wilbur H. ..... Minneapolis
§ Blake, Allan J. ..... Hopkins
§ Blake, James A. ..... Hopkins
§ Blake, Paul S. ..... Minneapolis
Bloch, Henry S. ..... Minneapolis
§ Bloedel, Traugott J. ..... Osseo
§ Blomberg, Robert D. ..... Minneapolis
§ Bloom, David ..... Minneapolis
§ Bloom, Norman B. ..... Minneapolis
§ Blumenthal, Jacob S. ..... Minneapolis
§ Boehrer, John J. ..... Minneapolis
§ Bofenkamp, Beniamin ..... Minneapolis
§ Bohn, Donald G. ..... Minneapolis
§ Boies, Lawrence R. ..... Minneapolis
÷ Booth, Albert E. ..... Minneapolis
*†Boreen, Clifton A. ..... Minneapolis
÷ Borgeson, Egbert J. ..... St. Paul
§ Borman, Chauncey N. ..... Minneapolis
§ Borowicz, Leonard A. ..... Minneapolis
§ Bowers, Gordon G. ..... Minneapolis
Boynton, Ruth E. ..... Minneapolis
Bradley, Jeanne B. ..... Minneapolis
Bradley, John G. ..... Minneapolis
Brandt, Henry E. ..... Minneapolis
†§ Bratrud, Arthur F. ..... Minneapolis
Brauti, Erling F. ..... Minneapolis
Bravick, Donald D. ..... Appleton, Wis.
Breitenbucher, Robert B. ..... Minneapolis
§ Brekke, Harvey J. ..... Minneapolis
Bridge, Allyn G. ..... Minneapolis
Brill, Alice K. ..... Minneapolis
÷ Brooks, Charles N. ..... Minneapolis
† Brown, Edgar D. ..... St. Petersburg, Fla.
Brown, William D ..... Minneapolis
§ Buchstein, Harold F. ..... Minneapolis
§ Buckley, Joseph J. ..... Minneapolis
§ Buirge, Raymond E. ..... Minneapolis
§ Burnham, Wesley H. ..... Minneapolis
§ Bushard, Wilfred L. ..... Minneapolis
§ Buzzelle, Leonard K. ..... Minneapolis
§ Cable, Morris L. ..... Minneapolis
§ Cabot, Clyde M ..... Minneapolis
*§ Cady, Laurence H. ..... Minneapolis
Cameron, Isabell L. ..... Minneapolis
Campbell, Frederick W. ..... Minneapolis
† Campbell, Lowell M. ..... Minneapolis
§ Campbell, Orwood J. ..... Minneapolis
§ Caplan, Leslie ..... Minneapolis
§ Card, William H. ..... Minneapolis
Carey, James B., Jr. ..... Minneapolis
§ Carlander, Lester W., Jr. ..... Minneapolis
§ Carlson, Charles V. ..... Mound
Carlson, Lawrence ..... Minneapolis
§ Carlson, Leonard T. ..... Minneapolis
§ Caron, Robert P. ..... Minneapolis
Carr, William J. ..... Minneapolis
§ Caspers, Carl G. ..... Minneapolis
Cauble, Charles F. ..... Minneapolis
†§ Cavanor, Frank T. ..... Minneapolis
§ Ceder, Elmer T. ..... Minneapolis
§ Cella, Joseph A. ..... Minneapolis
§ Chadbourn, Wayne A. ..... Minneapolis
Challman, S. Alan ..... Minneapolis
† Chavez, Demetrio A. ..... Minneapolis
§ Chesler, Merrill D. ..... Minneapolis
Child, Sherman B. ..... Minneapolis
§ Chisholm, Tague C. ..... Minneapolis
§ Christensen, Llewellyn E. ..... Minneapolis
Christenson, Leland R. ..... Maple Plain
Clark, Malcolm D. ..... Minneapolis
§ Clark, Robert S. ..... Minneapolis
§ Clay, Lyman B. ..... Minneapolis
§ Cochrane, Ray F. ..... Minneapolis
Coe, John I. ..... Minneapolis
§ Cohen, Bernard A. ..... Minneapolis
Cohen, Ephriam B. ..... Minneapolis
Cohen, Henry W. ..... Minneapolis
Cohen, Maynard M. ..... Minneapolis
§ Cohen, Sumner S. ..... Minneapolis
§ Cole, James S. ..... Minneapolis
§ Cooper, John P. ..... Minneapolis
§ Cooper, Robert R. ..... Minneapolis
Corniea, Albert D. ..... Minneapolis
§ Correa, Dale H. ..... Minneapolis
Cowan, Donald W. ..... Minneapolis
Craig, M. Elizabeth ..... St. Louis Park
†§ Cranmer, Richard R. ..... Minneapolis
Cranston, Robert W. ..... Minneapolis
§ Creevy, Charles D. ..... Minneapolis
§ Culligan, Leo C. ..... Minneapolis
§ Cundy, Donald T. ..... Minneapolis
Cushing, Richard T. ..... St. Louis Park
† Cutts, George ..... Minneapolis
§ Daggett, Donald R. ..... Minneapolis
§ Dahl, Elmer O. ..... Minneapolis
§ Dahl, James C. ..... St. Louis Park
§ Dahl, John A. ..... Minneapolis
† Daniel, Donald H. ..... Minneapolis
Danyluk, Michael ..... Minneapolis
Dargay, Cyril P. ..... Minneapolis
§ David, Reuben ..... Hopkins
Davis, Eunice A. ..... Minneapolis
§ Davis, Jay C. ..... Minneapolis
§ Dehnel, Luther L. ..... Minneapolis
del Plaine, Carlos W. ..... Minneapolis
§ Devereaux, Thomas J. ..... Wayzata
† DeWall, Richard A. ..... Minneapolis
Dickman, Roy W. ..... Minneapolis
§ Diefenbach, Eugene J. ..... Minneapolis
Diehl, Harold S. ..... New York
§ Dierker, Heinrich A. ..... Minneapolis
Diessner, Henry D. ..... Minneapolis
§ Doan, Robert E. ..... Wayzata
Doerr, Gerhard M. ..... Minneapolis
§ Donatelle, Edward P. ..... Minneapolis
§ Dorge, Richard I. ..... Minneapolis
§ Dorsey, George C. ..... Minneapolis
§ Dorsey, George C., Jr. ..... Minneapolis
Doscherholmen, Alfred ..... Minneapolis
† Doxey, Gilbert L. ..... Minneapolis
§ Doyle, Lawrence O. ..... Minneapolis
†§ Drake, Charles R. ..... Minneapolis
§ Drill, Herman E. ..... Hopkins
§ Duff, Edwin R. ..... Minneapolis
§ Dummer, Donald J. ..... New Brighton
§ Dunlap, Earl H. ..... Minneapolis
§ Dupont, Joseph A. ..... Excelsior

§ Duryea, Marbry.....Minneapolis
§ Duryea, Willis M.....Minneapolis
§ Duryea, Willis, M., Jr.....Minneapolis
Dvorak, Benjamin, A.....Minneapolis
Dwan, Paul F.....Minneapolis
§ Dworsky, Samuel D.....Minneapolis
§ Eder, Walter P.....Minneapolis
§ Ehrenberg, Claude J.....Minneapolis
Eich, Matthew A.....Minneapolis
Eichhorn, Edmund P., Jr.....Minneapolis
§ Eisenstadt, David H.....Minneapolis
§ Eisenstadt, William S.....Minneapolis
Eitel, George D.....Minneapolis
Eli, Earl W.....Minneapolis
§ Ellison, David E.....Minneapolis
§ Ellison, Ellis .....Minneapolis
§ Ellison, Evan S.....Minneapolis
Ellwood, Paul M., Jr.....Minneapolis
Elrod, Calvin R.....Long Lake
Emond, Albert J.....Farmington
Emond, Joseph S.....Farmington
§ Engel, Joseph P.....Minneapolis
§ Engelhart, Peter C.....Minneapolis
§ Englund, Elvin F.....Minneapolis
§ Engstrand, Oscar J.....Minneapolis
§ Erickson, Clifford O.....Minneapolis
§ Erickson, Laurence F.....Minneapolis
§ Erickson, Myron E.....Minneapolis
§ Erickson, Reuben F.....Minneapolis
§ Erlich, S. Paul.....Minneapolis
§ Esensten, Sidney.....Minneapolis
Etzwiler, Donnell D.....Minneapolis
§ Evans, Edward T.....Minneapolis
Evans, Robert D.....Minneapolis
† Fahr, George E.....Minneapolis
§ Fansler, Walter A.....Minneapolis
§ Feeney, John M.....Minneapolis
§ Feigal, David W.....Wayzata
Feinberg, Philip.....Minneapolis
Feinberg, Samuel B.....Minneapolis
§ Feinstein, Julius Y.....Minneapolis
§ Fenger, Ejvind P. K.....Oak Terrace
§ Field, Charles W.....Minneapolis
Fifer, William R. .....St. Louis Park
§ Fingerman, David L.....Minneapolis
§ Fink, Leo W.....Minneapolis
§ Fink, Robert J.....Minneapolis
§ Fink, Walter H.....Minneapolis
Fisher, Don H.....Minneapolis
Fisher, Isadore.....Minneapolis
† Fjeldstad, C. Alford .....Minneapolis
Fleeson, William H.....Minneapolis
Fleming, Dean S.....Minneapolis
§ Fliehr, Richard R.....Minneapolis
Flink, Edmund B.....Minneapolis
Foker, Leslie W.....Minneapolis
§ Folsom, Louis B.....Minneapolis
§ Ford, William H.....Minneapolis
§ Foster, Orley W.....Minneapolis
†§Fowler, L. Haynes....Newport Beach, Calif.
† Fox, Donald P.....Tanganyika, East Africa
§ Fox, James Rogers.....Minneapolis
§ Frane, Donald B.....Minneapolis
§ Fredericks, George M.....Minneapolis
§ Freeman, Craig W.....Minneapolis
Freeman, Donald W.....St. Louis Park
§ French, Lyle A.....Minneapolis
§ Frey, Richard J.....Minneapolis
§ Friberg, Joseph B.....Minneapolis
§ Fried, Louis A.....Minneapolis
§ Friedell, Aaron.....Minneapolis
Friedell, George.....Minneapolis
§ Friedman, Harry S.....Minneapolis
§ Frost, John B.....Minneapolis
§ Frost, Russell H.....St. Paul
§ Frykman, Howard M.....Minneapolis
§ Frys, Russell N.....Minneapolis
† Fuller, Alice H.....Minneapolis
§ Funk, Victor K.....Oak Terrace
Furman, L. Christine.....Minneapolis
§ Fusaro, Ramon M.....Minneapolis
§ Gaard, Richard C.....Minneapolis
Galejs, Aina.....Minneapolis
§ Gallett, Lester E.....Minneapolis
† Galligan, Margaret Mary D.....Minneapolis
§ Gammell, John H.....Minneapolis
§ Garamella, Joseph J.....Minneapolis
§ Garske, George L.....Minneapolis
Garten, Joseph L.....Minneapolis
§ Garvey, James T.....Minneapolis
Gault, Neal L., Jr.....
APO—San Francisco, Calif.
† Gault, Sarah J...APO—San Francisco, Calif.
§ Gaviser, David.....Minneapolis
§ Geller, Joseph.....Minneapolis
§ George, Vane P., Jr.....Minneapolis
§ Gibbs, Robert W.....Minneapolis
§ Giebenhain, John N.....Minneapolis
§ Giere, Joseph C.....Minneapolis
§ Giere, Richard W.....Minneapolis
Gilbert, Maurice G.....Minneapolis
Gilbertsen, A. Sigrid.....Minneapolis
Gilbertsen, Victor A.....Minneapolis
Gingold, Benjamin A.....Minneapolis
§ Glaeser, John H.....Minneapolis
§ Godfrey, H. Wilson.....Minneapolis
§ Gold, David.....Minneapolis
§ Goldberg, Isadore M.....Minneapolis
Goldberg, Marvin E.....Minneapolis
§ Goldman, Theodore I.....Minneapolis
§ Goldner, Meyer Z.....Minneapolis
§ Goltz, Robert W.....Minneapolis
§ Good, Gary.....Minneapolis
§ Good, Hoff D.....Minneapolis
Goodchild, William R.....Minneapolis
§ Gordon, John R.....Minneapolis
Gordon, Philip E.....Minneapolis
§ Gordon, Sewell S.....St. Louis Park
Grant, Suzanne.....Minneapolis
†§Gratzek, Frank R.....Anoka
Gray, Royal C.....Minneapolis
Green, Clayton Robbie.....Excelsior
Green, Robert A.....St. Louis Park
Greene, Leonard H.....Minneapolis
§ Greenberg, Albert J.....Minneapolis
§ Greenfield, Irving.....Minneapolis
Greenspan, Richard H.....New Haven, Conn.
¶ Greisheimer, Esther M.....Philadelphia, Pa.
Grimes, Marian.....Minneapolis
§ Grimmell, Francis J.....Minneapolis
§ Grismer, Jerome T.....St. Louis Park
§ Gronvall, Paul R.....Minneapolis
§ Grotting, John K.....Minneapolis
§ Gruys, Robert I.....Minneapolis
§ Gullickson, Glenn, Jr.....Minneapolis
§ Gunlaugson, Frederick G.....Minneapolis
§ Gustafson, Paul O.....Minneapolis
§ Gustason, Harold T.....Minneapolis
Haberer, Helen R.....Minneapolis
§ Haberle, Charles A.....Minneapolis
§ Hagen, Wayne S.....Minneapolis
† Haggard, George D.....Minneapolis
§ Hall, Harry B.....Minneapolis
§ Hall, Wendell H.....Minneapolis
§ Hambidge, Gove, Jr.....Minneapolis
§ Hamel, Joseph I.....Minneapolis
Hammerstad, Lynn M.....Minneapolis
Hammerstrom, Robert N.....Minneapolis
§ Hannah, Hewitt B.....Minneapolis
§ Hansen, Cyrus O.....Minneapolis
§ Hansen, Erling W.....Minneapolis
Hansen, Olga S.....Minneapolis
§ Hansen, Rollin M.....Minneapolis
§ Hanske, Edward A.....Minneapolis
§ Hanson, Harlow J.....Minneapolis
Hanson, Harold B.....Minneapolis
Hanson, Harold W.....Minneapolis
† Hanson, Henry V.....St. Paul
§ Hanson, Malcolm B.....Minneapolis
§ Hanson, Mark C. L.....Minneapolis
§ Hanson, William A. H.....Minneapolis
§ Hanson, William B.....Minneapolis
§ Happe, Lawrence J.....Minneapolis
§ Harris, Leon D.....Minneapolis
§ Harrison, William C.....Minneapolis
Hartman, Evelyn E.....Minneapolis
§ Hartwig, John A.....Minneapolis
§ Hass, Frederick, M.....Minneapolis
§ Hastings, DeForest R.....Minneapolis
§ Hastings, Donald W.....Minneapolis
§ Hauge, Erling T.....Minneapolis
§ Haugen, George W.....Minneapolis
Haugen, John A.....Minneapolis
§ Hauser, Donald C.....Minneapolis
Hauser, George W.....Minneapolis
§ Havel, Robert J.....Minneapolis
§ Haven, Walter K.....Minneapolis
§ Hawkinson, Raymond P.....Minneapolis
§ Hay, Lyle J.....Minneapolis
† Hayes, James M.....San Diego, Calif.
§ Hays, Albert T.....Minneapolis
† Haywa, Eugene W.....Minneapolis
§ Head, Douglas P.....Minneapolis
§ Hebbel, Robert.....Minneapolis
§ Hedrick, Wm. L.....Minneapolis
§ Hempel, Dean.....Minneapolis
† Hendrickson, John F.....Minneapolis
§ Henrikson, Earl C.....Minneapolis
† Henry, Clifford E.....Kirksville, Mo.
Herbert, Willis L.....Minneapolis
§ Hermann, Harold W.....Minneapolis
§ Hildebrandt, Walter C.....Minneapolis
Hilgermann, George O.....Minneapolis
Hill, Earl.....Minneapolis
§ Hill, Elmer M.....St. Paul
† Hillis, Samuel J.....E. Bradenton, Fla.
Hinckley, Robert G.....Minneapolis
§ Hitchcock, Claude R.....Minneapolis
§ Hodges, Kenneth V.....Minneapolis
§ Hoffbauer, Frederick W.....Minneapolis
§ Hoffert, Henry E.....Minneapolis
§ Hoffman, Roy A.....Minneapolis
§ Hoffman, Walter L.....Minneapolis
§ Hofmann, Gerald N.....Minneapolis
§ Holmberg, Conrad J.....Minneapolis
§ Holzapfel, Fred C.....Minneapolis
§ Hopperstad, J. Jerome.....Minneapolis
§ Hoppes, Emerson E.....Minneapolis
Horns, Howard L.....Minneapolis
§ Horns, Richard C.....Minneapolis
§ Hoseth, Wayne L.....Minneapolis
Houkom, B. J. Arne.....Minneapolis
§ Houle, Rollin J.....New Brighton
Hovland, Melvin L.....Minneapolis
§ Howard, Robert B.....Minneapolis
Howard, Solomon E.....Minneapolis
§ Howell, Carter W.....Minneapolis
§ Hoyt, C. Sherman.....Minneapolis
† Huenekens, Edgar J.....Minneapolis
§ Hulteng, Donald B.....Wayzata
§ Hultkrans, Rudolph E.....Minneapolis
Hurr, Maland C.....Minneapolis
Hutchinson, Dorothy W.....Oak Terrace
§ Hymes, Charles.....Minneapolis
*†Hynes, John E.....Minneapolis
Ide, Arthur W., Jr.....Minneapolis
§ Idstrom, Linneus G.....Minneapolis
§ Indeck, Walter.....St. Louis Park
§ Ingalls, Edgar G.....Minneapolis
† Irvine, Harry G.....Minneapolis
Iverson, Eleanor B.....Minneapolis
§ Iverson, Rolf M.....Minneapolis
§ Jackson, J. Albert.....Minneapolis
Jackson, Richard L.....Minneapolis
§ Jacobson, Loren J.....Rochester
§ Jacobson, Wyman E.....St. Louis Park
§ Janda, George W., Jr.....Minneapolis
§ Jay, Alan R.....Minneapolis
Jedrzejewski, W. Jay.....Minneapolis
§ Jefferies, William L.....St. Louis Park
§ Jensen, Harry C.....Minneapolis
† Jensen, Marius J.....Minneapolis
§ Jensen, Nathan K.....Minneapolis
Jensen, Reynold A.....Minneapolis
§ Jepson, William W.....Minneapolis
Jerome, Bourne.....Minneapolis
Jerome, Elizabeth B.....Minneapolis
§ Jeub, Robert P.....Minneapolis
§ Johnson, Angelo G.....Minneapolis
§ Johnson, Arthur B.....Minneapolis
§ Johnson, David R.....Minneapolis
Johnson, Edward A.....Minneapolis
Johnson, Emil W.....Minneapolis
§ Johnson, Frank E.....Minneapolis
§ Johnson, Harry A.....Minneapolis
†§Johnson, James A.....Minneapolis
§ Johnson, John W.....Minneapolis
§ Johnson, Malcolm R.....Minneapolis
Johnson, Norman P.....Minneapolis
Johnson, Norman Paul.....Minneapolis
§ Johnson, Norton T.....Minneapolis
§ Johnson, Paul E.....Minneapolis
§ Johnson, Reinald G.....Minneapolis
Johnson, Reuben A.....Minneapolis
§ Johnson, Richard S.....Minneapolis
§ Johnson, Robert E.....Minneapolis
Johnson, Roger S.....Wayzata
Johnson, Youbert T.....Minneapolis
Jones, David G.....Minneapolis
†§Jones, Herbert W., Jr.....Minneapolis
§ Jones, Richard H.....Minneapolis
Jordon, Donald V.....Minneapolis
* Josewich, Alexander.....Minneapolis
§ Judd, Allen S.....Minneapolis
§ Judd, Walter H.....Washington, D. C.
§ Jurdy, Mitchell J.....Minneapolis
§ Kadesky, Harold B.....Minneapolis
§ Kalin, Oscar T.....Minneapolis
§ Kallestad, Leonard L.....Wayzata
§ Kaplan, Harold A.....Minneapolis
§ Kaplan, J. Jacob.....Minneapolis
§ Karleen, Conrad I.....Minneapolis
§ Karlen, Markle.....Minneapolis
Kasper, Robert E.....Minneapolis
Kaufman, Herschel J.....Minneapolis
§ Kelby, Gjert M.....Minneapolis
§ Kelly, Charles F.....Minneapolis
§ Kelly, John P.....Minneapolis
§ Kelly, John T.....Minneapolis
Kennedy, Byrl J.....Minneapolis
† Kennedy, Claude C.....Minneapolis
† Kennedy, Jane F.....Minneapolis
§ Kerkhof, Arthur C.....Minneapolis
Kiesler, Frank, Jr.....Minneapolis
§ Kim, Mark K.....Minneapolis
§ Kimmel, George C.....Minneapolis
King, Frances W.....Oak Terrace
§ Kinsella, Thomas J.....Minneapolis
Kjenaas, Ervin A.....Hastings
§ Knapp, Miland E.....Minneapolis
†§Knight, Ralph T.....Minneapolis
† Knight, Ray R.....Minneapolis
Knudsen, Helen L.....Minneapolis
§ Koepcke, Gerald M.....Minneapolis
Kogl, Richard C.....Minneapolis
Kohlhase, Robert E.....Minneapolis
† Koller, Hermann M.....Minneapolis
†§Koller, Louis R.....Minneapolis
Koller, Robert L.....St. Louis Park
Korchik, John P.....Minneapolis
Kosiak, John.....Minneapolis

Kottke, Frederic J. ..... Minneapolis
Koucky, Rudolph W. ..... Minneapolis
§ Kovack, Freeman D. ..... Minneapolis
Kozak, Michael J. ..... Minneapolis
§ Krafchuk, John D. ..... Minneapolis
§ Krafft, Walter E. ..... Minneapolis
§ Kragh, Lyle V. ..... Minneapolis
§ Kremen, Arnold J. ..... Minneapolis
Krieser, Albert E. ..... Minneapolis
Krystosek, Lee A. ..... Minneapolis
§ Kucera, Frank J. ..... Hopkins
† Kucera, William J. ..... Santa Barbara, Calif.
§ Kump, Warren L. ..... Minneapolis
§ Kutz, Clarence V. ..... Minneapolis
LaBree, John W. ..... St. Louis Park
§ Lagaard, Sheldon M. ..... Minneapolis
† Lajoie, John M. ..... Minneapolis
§ Lamb, H. Douglas ..... Minneapolis
§ Lang, Leonard A. ..... Minneapolis
†§ Lapierre, Arthur P. ..... Minneapolis
§ Larsen, Frank W. ..... Minneapolis
§ Larson, Arthur K. ..... Minneapolis
§ Larson, Clarence M. ..... Minneapolis
§ Larson, Donald M. ..... Minneapolis
§ Larson, Lawrence M. ..... Minneapolis
Larson, Leonard M. ..... Oak Terrace
Larson, Loren J. ..... Minneapolis
§ Larson, Paul N. ..... Minneapolis
Larson, Roger C. ..... Minneapolis
Latts, Elliot M. ..... Minneapolis
† LaVake, Rae T. ..... Minneapolis
Lawson, Warren R. ..... Minneapolis
Laymon, Carl W. ..... Minneapolis
§ Leavenworth, Richard O., Jr. ..... St. Louis Park
§ Leemhuis, Andrew J. ..... Minneapolis
§ Leiferman, Robert J. ..... Minneapolis
Leinonen, Wendla E. ..... Anoka
§ Leland, Harold R. ..... Minneapolis
Lenz, Oa ..... Minneapolis
§ Leonard, Lawrence J. ..... Minneapolis
§ Leonard, Samuel ..... Minneapolis
Lerner, A. Ross ..... Minneapolis
§ Lester, Richard G. ..... Minneapolis
Lienke, Roger I. ..... Robbinsdale
Lillehei, C. Walton ..... Minneapolis
Lillehei, Elmer J. ..... Robbinsdale
§ Lindberg, Arthur N. ..... Minneapolis
*† Lindberg, Arvid C. ..... Minneapolis
Lindberg, Vernon L. ..... Minneapolis
§ Lindberg, Winston R. ..... Minneapolis
§ Lindblom, Maurice L. ..... Minneapolis
Lindemann, Charles E. ..... Minneapolis
Linderholm, Bruce E. ..... Minneapolis
§ Lindgren, Russell C. ..... Minneapolis
Lindquist, Richard H. ..... Minneapolis
§ Linner, Gunnar ..... Minneapolis
†§ Linner, Henry P. ..... Minneapolis
§ Linner, John H. ..... Minneapolis
§ Linner, Paul W. ..... Minneapolis
* Lippman, Emanuel S. ..... Minneapolis
Lipschultz, Oscar ..... Minneapolis
† Litchfield, John T. ..... Minneapolis
Litman, Abraham B. ..... Minneapolis
Lober, Paul H. ..... Minneapolis
§ Lofsness, Stanley V. ..... Oak Terrace
†§ Logefeil, Rudolph C. ..... Minneapolis
§ Logothetis, John A. ..... Minneapolis
† Loomis, Earl A. ..... Winona
§ Lott, Frederick H. ..... Minneapolis
Lovett, Beatrice R. ..... Wayzata
Lowry, Elizabeth C. ..... Minneapolis
Lowry, Paul T. ..... Minneapolis
Lowry, Thomas ..... Minneapolis
Lueck, Wallace W. ..... Minneapolis
§ Lufkin, Nathaniel H. ..... Minneapolis
Lund, George W. ..... Minneapolis
Lundberg, Ruth I. ..... Minneapolis
Lundblad, Roy A. ..... Minneapolis
Lundblad, Stanley W. ..... Minneapolis
§ Lundeberg, Karl R. ..... Minneapolis
§ Lundquist, Virgil J. P. ..... Minneapolis
† Lynch, Matthew J. ..... Minneapolis
§ Lyon, John D., Jr. ..... Hopkins
§ Lyons, James H. ..... Minneapolis
Lyons, Michael W. ..... Minneapolis
†§ Lysne, Henry ..... Minneapolis
§ Lysne, Myron ..... Minneapolis
† Lysyj, Anatol ..... Minneapolis
Lyzenga, Anton G. ..... Minneapolis
McCaffrey, F. John ..... Minneapolis
§ McCampbell, Malcolm D. ..... Minneapolis
§ McCannel, Malcolm A. ..... Minneapolis
McCarthy, Donald ..... Fort Snelling
§ McCormick, Donald P. ..... Minneapolis
† McDaniel, Orianna ..... Minneapolis
§ McFarland, Arthur H. ..... Minneapolis
§ McGandy, Robert F. ..... Minneapolis
§ McGeary, George E. ..... Minneapolis
§ McInerny, Maurice W. ..... Minneapolis
McKelvey, John L. ..... Minneapolis
§ McKenzie, Charles H. ..... Minneapolis
§ McKinlay, Chauncey A. ..... Minneapolis
§ McKinlay, Gordon L. ..... Minneapolis
†§ McKinney, Frank S. ..... Minneapolis
§ McLaughlin, Byron H. ..... Minneapolis
§ McMurtrie, William B. ..... Minneapolis
McNeil, John J. ..... Minneapolis
McParland, Felix A., Jr. ..... Minneapolis
§ McPheeters, Herman O. ..... Minneapolis
†§ MacDonald, Daniel A. ..... Minneapolis
§ MacDonald, John W. ..... Minneapolis
§ MacKinnon, Donald C. ..... Minneapolis
§ Mach, Frank B. ..... Minneapolis
Mach, John R. ..... Minneapolis
Macheledt, Neil L. ..... Anoka
§ Meader, Edward C. ..... Minneapolis
Magraw, Richard M. ..... Minneapolis
§ Mahle, James P. ..... Minneapolis
†§ Maland, Clarence O. ..... Minneapolis
§ Mandel, Sheldon L. ..... Minneapolis
§ Mankey, James C. ..... Minneapolis
Mann, George A. ..... Minneapolis
§ MarCia, Alfred M. ..... Minneapolis
§ † Margulis, Alexander R. ..... St. Louis, Mo.
§ Marking, George H. ..... Minneapolis
§ Markovitz, Jack M. ..... Minneapolis
§ Martin, Frank E. ..... Minneapolis
§ Martin, George R. ..... Minneapolis
Martinson, Carl J. ..... Wayzata
§ Martinson, Elmer J. ..... Wayzata
§ Mattson, Hamlin A. N. ..... Minneapolis
Maunder, John B. ..... Minneapolis
†§ Maxeiner, Stanley R. ..... Minneapolis
Maxeiner, Stanley R., Jr. ..... Minneapolis
§ Mayberg, Donald M. ..... Minneapolis
§ Meller, Robert L. ..... Minneapolis
§ Merkert, Charles E. ..... Minneapolis
§ Merkert, George L. ..... Minneapolis
§ Merner, Thomas B. ..... Minneapolis
† Merrick, Charlotte T. ..... St. Paul
Messenheimer, Myron G. ..... Minneapolis
§ Meyer, Alvin J. ..... Minneapolis
† Meyer, E. Lawrence ..... Minneapolis
Meyer, Robert J. ..... Bethany, Okla.
Michael, Joseph C. ..... Minneapolis
§ Michel, Henry H. ..... Minneapolis
§ Michelson, Henry E. ..... Minneapolis
† Mickelsen, Emma F. ..... Minneapolis
Middlebrook, John E. ..... Minneapolis
Miller, Arden L. ..... Minneapolis
§ Miller, Fletcher A. ..... Minneapolis
Miller, H. Dawes ..... Minneapolis
§ Miller, Harold E. ..... Minneapolis
§ Miller, Hugo E. ..... Minneapolis
§ Miller, J. Carleton ..... Minneapolis
§ Millett, D. Keith ..... Minneapolis
§ Milton, John S. ..... Minneapolis
§ Minder, John G. ..... Mound
Minsky, Armen A. ..... Minneapolis
§ Mitby, Irvin L. ..... Minneapolis
§ Mitchell, Berton D. ..... Minneapolis
§ Mitchell, Edward C. ..... Minneapolis
§ Mitchell, Mancel T. ..... Minneapolis
§ Mixer, Harry W. ..... Minneapolis
§ Moe, John H. ..... Minneapolis
Moe, W. Wyatt ..... Minneapolis
§ Moehn, John T. ..... Minneapolis
Moen, Johannes K. ..... Minneapolis
† Monahan, Elizabeth S. ..... Minneapolis
§ Monson, Einer M. ..... Minneapolis
§ Moore, Irvin H. ..... Minneapolis
Moorhead, Marie ..... Minneapolis
§ Moos, Daniel J. ..... Minneapolis
§ Moran, Leo J. ..... New Brighton
§ Mork, A. Harold ..... Anoka
§ Mork, Frank E. ..... Minneapolis
Morrell, Frank ..... Minneapolis
Morrison, Charlotte J. ..... Minneapolis
§ Mosser, Donn G. ..... Minneapolis
§ Moyer, Leonard B. ..... Minneapolis
§ Mulholland, William M. ..... Minneapolis
§ Murphy, Edmund P. ..... Minneapolis
Murray, Elisabeth M. ..... Minneapolis
Muske, Marvin M. ..... Minneapolis
§ Musty, Nicholas J. ..... Minneapolis
§ Myers, Jay A. ..... Minneapolis
§ Myhre, James ..... Minneapolis
Nagobads, Visvaldis J. ..... Minneapolis
Nash, Eldore B. ..... Minneapolis
§ Naslund, Ames W. ..... Minneapolis
Nauth, Bernard S. ..... Minneapolis
§ Neal, Joe M. ..... Minneapolis
Neary, Richard P. ..... Minneapolis
† Nelson, Bernette G. ..... Hoyt Lakes
† Nelson, Bernice A. ..... Minneapolis
Nelson, C. Barton ..... Minneapolis
Nelson, Carleton A. ..... Minneapolis
§ Nelson, Edward N. ..... Minneapolis
† Nelson, Erland R. ..... Minneapolis
Nelson, Gunard R. ..... Minneapolis
§ Nelson, Harvey ..... Minneapolis
§ Nelson, Lloyd S. ..... Minneapolis
Nelson, Maxine O. ..... Minneapolis
§ Nelson, Maynard C. ..... Minneapolis
§ Nelson, O. L. Norman ..... Minneapolis
§ Nelson, Wallace I. ..... Minneapolis
† Nerenberg, Sidney ..... Minneapolis
§ Nesset, Lawren B. ..... Minneapolis
§ Nesset, William D. ..... Minneapolis
Neumann, Roland F., Jr. ..... Minneapolis
§ Neumeister, Charles A. ..... Minneapolis
Nolan, Robert K. ..... Minneapolis
Noran, Axel S. N. ..... Minneapolis
§ Noran, Harold H. ..... Minneapolis
§ Nord, Robert E. ..... Minneapolis
† Nordin, Gustaf T. ..... Saratoga, Calif.
§ Nordland, Martin ..... Minneapolis
§ Nordland, Martin A. ..... Minneapolis
§ Norman, Mark L., Jr. ..... Minneapolis
Norval, Mildred A. ..... St. Paul
Nuessle, William F. ..... Minneapolis
§ Nydahl, Malvin J. ..... Minneapolis
§ Nylander, Emil G. ..... Minneapolis
§ O'Brien, William A. ..... Minneapolis
† O'Donnell, James E. ..... Minneapolis
O'Hanlon, John A. ..... Minneapolis
§ O'Phelan, E. Harvey ..... Minneapolis
Olavs, Olga ..... Minneapolis
§ Olfelt, Paul C. ..... Minneapolis
§ Olsen, E. George ..... Minneapolis
§ Olsen, Jay R. ..... Minneapolis
§ Olson, Alton C. ..... Minneapolis
§ Olson, Carl J. ..... Minneapolis
Olson, C. Kent ..... Minneapolis
§ Olson, Detlof M. ..... Minneapolis
§ Olson, Duane O. C. ..... Minneapolis
† Olson, Olaf A. ..... Minneapolis
§ Olson, Philip A. ..... Minneapolis
§ Olson, Rolland A. ..... Wayzata
§ Oppen, E. Gerhard ..... Minneapolis
§ Oppen, Melvin G. ..... Wayzata
§ Opstad, Earl T. ..... Minneapolis
Oswald, Arthur J. ..... Minneapolis
§ Ott, Eugene C. ..... Minneapolis
Owen, Richard R. ..... Minneapolis
Paal, Dwain J. ..... Minneapolis
Page, Raymond L. ..... Minneapolis
§ Palen, Benjamin J. ..... Minneapolis
§ Palmer, Gerald K. ..... Minneapolis
Papermaster, Theodore C. ..... Minneapolis
Park, Wilford E. ..... Minneapolis
§ Pattee, James J. ..... Minneapolis
§ Peluso, Charles R. ..... Minneapolis
†§ Peppard, Thomas A. ..... Minneapolis
§ Perlman, Everett C. ..... Minneapolis
Perlman, Herschel L. ..... Minneapolis
§ Peteler, Jennings C. L. ..... Minneapolis
Petersen, Byron D. ..... Minneapolis
§ Petersen, Deane A. ..... Wayzata
§ Petersen, Glenn L. ..... Minneapolis
Petersen, Peter C. ..... Minneapolis
§ Petersen, William E. ..... Minneapolis
§ Peterson, Herbert W. ..... Minneapolis
§ Peterson, Nordahl P. ..... Minneapolis
Peterson, Oliver H. ..... St. Louis Park
Peterson, Oliver H., Jr. ..... Minneapolis
§ Peterson, Palmer A. ..... Minneapolis
†§ Peterson, Peter E. ..... Minneapolis
§ Peterson, Willard C. ..... Minneapolis
Peterson, W. Henry ..... Minneapolis
§ Petit, Julien V. ..... Minneapolis
†§ Petit, Leon J. ..... Minneapolis
§ Pewters, John T. ..... Minneapolis
§ Peyton, William T. ..... Minneapolis
† Phelps, Kenneth A. ..... Menlo Park, Calif.
§ Pincus, Mitchell ..... Minneapolis
§ Plasha, Matthew K. ..... Coon Rapids
§ Plass, Herbert F. R. ..... Minneapolis
§ Plimpton, Nathan C. ..... Minneapolis
Pohl, John F. ..... Minneapolis
§ Pollak, Kurt ..... Minneapolis
§ Pollock, Anthony J. ..... Minneapolis
†§ Pollock, David K. ..... Minneapolis
§ Polzak, Jacob A. ..... Minneapolis
§ Popadiuk, Peter ..... Minneapolis
† Poppe, Frederick H. ..... Coral Gables, Fla.
Posey, Edward ..... Minneapolis
§ Potter, Robert B. ..... Minneapolis
† Pratt, Fred J., Sr. ..... Minneapolis
† Preine, Irving A. ..... Osseo
§ Prem, Konald A. ..... Minneapolis
*† Preston, Paul J. ..... Minneapolis
§ Price, William E. ..... Minneapolis
§ Priest, Robert E. ..... Minneapolis
†§ Prim, Joseph A. ..... Minneapolis
§ Proffitt, William E. ..... Minneapolis
§ Proshek, Lumir C. ..... Minneapolis
§ Quello, Robert O. ..... Minneapolis
§ Quiggle, Arthur B. ..... Minneapolis
§ Quist, Henry W., Jr. ..... Minneapolis
§ Racer, Harley J. ..... Minneapolis
§ Raile, Richard B. ..... Minneapolis
§ Ransom, H. Robert ..... Osseo
§ Ratelle, Alexander E. ..... Minneapolis
Reed, Sheldon C. ..... Minneapolis
§ Regan, John J. ..... Minneapolis
§ Regnier, Edward A. ..... Minneapolis
Reichel, Samuel M. ..... Minneapolis
§ Reif, Harold A. ..... Minneapolis
§ Reiley, Richard E. ..... Minneapolis
§ Reiser, Milton P. ..... Minneapolis
§ Remole, William D. ..... Minneapolis

§ Resch, Joseph A.....Minneapolis
§§ Reynolds, Donald P.....Minneapolis
Rholl, Arnold O.....Minneapolis
§ Rice, Carl O.....Minneapolis
Rice, Frank B.....Robbinsdale
Rice, Fred A.....Minneapolis
§§ Richardson, Robert J.....Minneapolis
§§ Richdorf, Lawrence F.....Minneapolis
§§ Rieke, Wellington W.....Wayzata
Riordan, Elsie M.....Minneapolis
Ripple, Rudolph J., Jr.....Minneapolis
§§ Risch, Ronald E.....Minneapolis
§§ Rizer, Dean K.....Minneapolis
*†Rizer, Robert I.....Wayzata
Robb, Edwin F.....Minneapolis
§§ Robbins, Owen F.....Minneapolis
§§§§ Roberts, Byron H.....Minneapolis
§§§§ Roberts, Lewis J.....Minneapolis
§§§§ Roberts, Stanley W.....Minneapolis
Robinson, Cortland O.....Minneapolis
§§ Rock, William H.....Anoka
§§§ Rocknem, Robert E.....Minneapolis
Rockwell, Curtiss V.....Minneapolis
† Rodda, Frederick C.....Minneapolis
† Rodgers, Richard S.....Minneapolis
Rogin, Norton.....Minneapolis
Rollins, Pat.....Wayzata
Romness, Kenneth B.....Mound
Rosenbaum, David L.....Minneapolis
Rosendahl, Frederick G.....Minneapolis
Rosenfield, Abraham B.....Minneapolis
Rosenow, John H.....Minneapolis
† Rosenwald, Reuben M.....Anoka
§§§§ Ross, Alexander J.....Minneapolis
§§§§ Rossen, Ralph X.....Minneapolis
Rotenberg, Robert J.....Minneapolis
Rotenberg, Samuel .....Minneapolis
§ Rothnem, Morris S.....Minneapolis
Rucker, William H.....Minneapolis
Rud, Norman E.....Minneapolis
*†Rudell, Gustave L.....Minneapolis
§§§§ Runquist, Richard K.....Anoka
§§§§ Russeth, Arthur N.....Minneapolis
§§§§ Rusten, Elmer M.....Minneapolis
Rydburg, Wayne C.....Minneapolis
§§§§ Rydland, Arne D.....Minneapolis
St. Cyr, Harry M.....Robbinsdale
St. Cyr, Kenneth J.....Robbinsdale
Sadler, William P.....Minneapolis
§§§§ Safirescu, Sorin R.....San Francisco, Calif.
§§§§ Saliterman, Bernard I.....Minneapolis
Sandler, Bernard.....Minneapolis
Sandt, Karl E.....Minneapolis
§§§§ Sawatzky, William A.....Minneapolis
§§§§ Sborov, Abe M.....Minneapolis
Scallen, Raymond W.....Minneapolis
§ Schaaf, Frederick H. K.....Minneapolis
Schaar, Frances E.....Minneapolis
§ Schaefer, Kenneth F.....Minneapolis
Schaefer, Wesley G.....Minneapolis
§ Schafer, Thomas L.....Minneapolis
Schaffhausen, Irwin F.....Minneapolis
Schaffhausen, Mildred.....Minneapolis
† Scheldrup, N. H.....Miami, Fla.
§ Scherer, L. Raymond.....Minneapolis
Scherling, Sidney S.....Minneapolis
§§§§ Schiele, Burtrum C.....Minneapolis
§§§§ Schissel, Gregory A.....Robbinsdale
Schmidt, W. Robert.....Minneapolis
† Schmitt, S. C.....Los Angeles, Calif.
Schneck, Jack I.....Minneapolis
§§§§ Schottler, Max E.....Minneapolis
§§§§ Schroeder, Albert J.....Minneapolis
§§§§ Schultz, Alvin L.....Minneapolis
§§§§ Schultz, Earl A.....Minneapolis
§§§§ Schultz, J. Harold.....Minneapolis
§§§§ Schultz, Peter J.....Minneapolis
Schulze, William M.....Minneapolis
Schumacher, John W.....Minneapolis
§§§§ Schwartz, E. Robert.....Minneapolis
§§§§ Schwartz, Virgil J.....Minneapolis
§§§§ Scott, Horace G.....Minneapolis
† Seaberg, John A.....Pequot Lakes
Segal, Edward L.....Minneapolis
§§§§ Segal, Martin A.....Minneapolis
§§§§ Seham, Max.....Minneapolis
§§§§ Seifert, Milton H.....Excelsior
Selck, Wolfgang T. E.....Minneapolis
§§§§ Semsch, Robert D.....Wayzata
§§§§ Shandorf, James F.....Minneapolis
Shaperman, Eva P.....Minneapolis
§§§§ Shapiro, Irving.....Minneapolis
§§§§ Shapiro, Sidney K.....Minneapolis
§§§§ Sharp, David V.....Minneapolis
§§§§ Shaw, Howard A.....Minneapolis
§§§§ Shea, Andrew W.....Minneapolis
§§§§ Sher, Lewis.....Minneapolis
§§§§ Sherman, Lloyd F.....Minneapolis
§§§§ Sherman, Morris H.....Minneapolis
Shillington, Maurice A.....Brainerd
§§§§ Shragg, Robert I.....Wayzata
§§§§ Shronts, John F.....Minneapolis
§§§§ Sidell, Franklin D.....Minneapolis
Siegmann, William C.....Minneapolis
§ Silas, Ralph M.....Minneapolis
Silver, John D.....Minneapolis
§§§§ Simmons, Richard K.....Minneapolis
† Simons, Jalmar.....Aspen, Colo.
§§§§ Simonson, Donald B.....Minneapolis
† Simpson, Ellery De W.....Asheville, N. C.
§§§§ Sinykin, Melvin B.....Minneapolis
§§§§ Sipe, James W.....Coon Rapids
Siperstein, David M.....Minneapolis
Sisterman, Thomas J.....Minneapolis
§ Skjold, Arthur C.....Minneapolis
Smiley, John T.....Minneapolis
§ Smisek, Frank M.....Minneapolis
Smith, Adam M.....Minneapolis
§§§§ Smith, Archie M.....St. Louis Park
§§§§ Smith, Baxter A., Jr.....Minneapolis
§§§§ Smith, Graham G.....Minneapolis
Smith, John E.....St. Louis Park
† Smith, Margaret I.....Gardena, Calif.
Smith, Nadine G.....Minneapolis
Smith, Norvin R.....Willmar
§§§§ Smith, Theodore S.....Minneapolis
§§§§ Smith, William T.....Minneapolis
§§§§ Soderlind, Ragnar T.....Minneapolis
§§§§ Solhaug, Samuel B., Jr.....Minneapolis
§§§§ Solvason, Harold M.....Minneapolis
Spain, W. Thomas.....Evansville, Ind.
§§§§ Spano, Joseph P.....Minneapolis
§§§§ Spencer, Bernard J.....Minneapolis
§§§§ Spink, Wesley W.....Minneapolis
§§§§ Sponsel, Kenath H.....Minneapolis
† Spratt, Charles N.....Minneapolis
Stahr, Aubrey C.....Hopkins
§§§§ Stanford, Charles E.....Echo, Wis.
† Stanley, Court R.....Minneapolis
§§§§ Staub, Henry P.....Minneapolis
§§§§ Stelter, Lloyd A.....Minneapolis
§§§§ Stennes, John L.....Minneapolis
† Stenstrom, Annette..Marine on the St. Croix
§§§§ Stephens, William E.....Minneapolis
§§§§ Sterrie, Norman A.....St. Louis Park
§§§§ Stewart, Marvin J.....Minneapolis
§§§§ Stewart, Rolla I.....Minneapolis
§§§§ Stiegler, Farrell S.....Minneapolis
§§§§ Stoesser, Albert V.....Minneapolis
§§§§ Stoltz, Robert C.....Minneapolis
† Stomel, Joseph.....Los Angeles, Calif.
Stone, Norman F.....Minneapolis
Stone, Stanley P.....Minneapolis
§§§§ Strickler, Jacob H.....Minneapolis
§§§§ Strom, Gordon W.....Minneapolis
§§§§ Stromgren, Delph T.....Minneapolis
§§§§ Stromme, William B.....Minneapolis
Strunk, Clarence A.....Minneapolis
§ Sturges, Robert L.....Minneapolis
Subak, Barbara H.....Minneapolis
†§§ Subby, Walter, Jr.....Wayzata
Sukov, Marvin.....Minneapolis
Sullivan, Raymond M.....Minneapolis
Swanson, Roy E.....Minneapolis
§§§§ Sweetser, Horatio B.....Minneapolis
§§§§ Sweetser, Theodore H.....Minneapolis
§§§§ Sweetser, Theodore H., Jr.....Minneapolis
† Sweitzer, Samuel E.....Minneapolis
§†Swendseen. Carl G.....Minneapolis
Syverton, Jerome T.....Minneapolis
§§§§ Tam, Ernest C.....Minneapolis
§§§§ Tangen, George M.....Minneapolis
Taylor, Joseph H.....Minneapolis
§§§§ Taylor, William E.....Minneapolis
§§§§ Tenner, Robert J.....Minneapolis
Tesar, Charles E.....Minneapolis
Thal, Alan P.....Minneapolis
Theobalt, Inge M.....Minneapolis
Thomes, A. Boyd.....Minneapolis
Thompson, Arthur.....Minneapolis
§ Thompson, Russell A.....Minneapolis
§ Thompson, Willis H.....Minneapolis
Thorsen, David S.....Minneapolis
§§§§ Thorson, Stuart V.....Minneapolis
§§§§ Thysell, Desmond M.....Minneapolis
§§§§ Tinkham, Robert G.....Minneapolis
§§§§ Titrud, Leonard A.....Minneapolis
Tobin, John D.....Minneapolis
§ Todd, Thomas N. F.....Minneapolis
§§§§ Trach, Benedict B.....Minneapolis
§ Trow, James E.....Minneapolis
Trow, William H.....Minneapolis
Trueman, Harold S.....Minneapolis
† Tsai, Shih Hao.....Minneapolis
§§§§ Tucker, Richard C.....Minneapolis
§§§§ Tudor, Richard B.....Minneapolis
† Turnacliff, Dale D.....St. Paul
§ Twidwell, Joseph E.....Minneapolis
Twomey, John E.....Minneapolis
†§Ulrich, Henry L.....Minneapolis
§§§§ Ulvestad, Harold S.....Minneapolis
*†Undine, Clyde A.....Minneapolis
§§§§ Utendorfer, Robert W.....Minneapolis
§§§§ Valgemae, Romil.....Minneapolis
Veinbergs, Arnolds.....Minneapolis
§ Vennes, Jack A.....St. Louis Park
Vik, A. Elliott.....Minneapolis
§§§§ Von Drashek, Stanley C.....Minneapolis
§§§§ Wagner, Robert M.....Minneapolis
§§§§ Wahlquist, Harold F.....Minneapolis
Waldron, Carl W.....Hopkins
§ Wall, Carl R.....Minneapolis
Wallace, Helen M.....Washington, D. C.
§ Walonick, Albert L.....St. Louis Park
Walsh, Francis M.....Minneapolis
§§§§ Walsh, William T.....Minneapolis
§§§§ Wangensteen, Owen H.....Minneapolis
Ward, Percy A.....Minneapolis
§ Watson, C. Gordon.....Minneapolis
Watson, Cecil J.....Minneapolis
Wattenberg, Lee W.....Minneapolis
Weatherhead, Donald S. P.....Minneapolis
¶ Weaver, Myron M.....Schenectady, N. Y.
§§§§ Webb, Edgar A.....Minneapolis
§§§§ Webber, Richard J.....St. Louis Park
§§§§ Weber, Lowell W.....Minneapolis
§§§§ Weisberg, Rapheal J.....Minneapolis
§§§§ Wendland, John P.....Minneapolis
Werner, George.....Minneapolis
§§§§ Wesolowski, Stanley.....Minneapolis
† West, Catherine C.....Minneapolis
Wetherby, Macnider.....Minneapolis
§§§§ Wexler, Harold M.....Minneapolis
§§§§ Wheeler, Robert W.....Minneapolis
Whitacre, John C., II.....Minneapolis
§§§§ White, Asher A.....Minneapolis
†§White, S. Marx.....Minneapolis
§§§§ White, Willard D.....Minneapolis
§§§§ Whitesell, Lloyd A.....Minneapolis
§§§§ Widen, Wilford F.....Minneapolis
Wild, John J.....Minneapolis
† Wilder, Kenneth W.....Minneapolis
† Wilder, Robert L.....Minneapolis
† Wilder, R. M., Jr.....Topeka, Kansas
§§§§ Wilder, Walter L.....Minneapolis
§§§§ Wilken, Paul A.....Minneapolis
Williams, Francis R.....Wayzata
§§§§ Williams, Paul A.....Minneapolis
§§§§ Williams, Richard E.....Robbinsdale
† Williams, Robert.....Unknown
§§§§ Wilson, Robert E.....Minneapolis
Winchell, Paul.....Minneapolis
Winther, Nora M. C.....Minneapolis
§§§§ Wippermann, Frederic F.....Minneapolis
†§Witham, Carl A.....Minneapolis
†§Wittich, Frederick W.....Minneapolis
§§§§ Wohlrabe, Arthur A.....Minneapolis
§§§§ Wohlrabe, A. Cabot.....Minneapolis
§§§§ Wolf, Alfred H.....Minneapolis
§§§§ Wolter, Frederick H.....Minneapolis
§§§§ Wright, Thomas D.....Minneapolis
§§§§ Wright, Wale S.....Minneapolis
§§§§ Wright, William S.....Minneapolis
† Wynne, Herbert M. N.....Minneapolis
Yelle, Matthew D.....Anoka
§§§§ Ylvisaker, Ragnvald S.....Minneapolis
†§Yoerg, Otto W.....Minneapolis
Yue, Wen Y.....Oak Terrace
Zahrendt, O. Lewis.....Minneapolis
§§§§ Zarling, V. Richard.....Minneapolis
§§§§ Zaworski, Leo A.....Minneapolis
Zierold, Arthur A.....Minneapolis
§§§§ Zinter, Ferdinand A.....Minneapolis
†§Ziskin, Thomas.....Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Kandiyohi, Swift, and Meeker Counties
Regular meetings, third Thursday
Annual meeting, 3rd Thursday in November
Number of Members—53

President
DANIELSON, LENNOX.....Litchfield
Secretary
CARLON, DONALD L.....Willmar

§§§§ Allison, David D.....Litchfield
§§§§ Bilon, Thomas E.....Willmar
§§§§ Bosland, Howard G.....Willmar
§§§§ Carlon, Donald L.....Willmar
Chunn, Stanley S.....Willmar
*†Daignault, Oscar.....Benson
† Danielson, Karl A.....Litchfield
Danielson, Lennox.....Litchfield

Dille, Donald E.....Litchfield
§ Docksey, John W.....Willmar
Drexler, Charles J.....Litchfield
§ Dunstan, Paul L.....Willmar
Eberley, Tobe S.....Benson
§ Ellinger, Albert J.....Willmar
Fedor, Robert D.....Litchfield
§ Ford, F. Wendell.....New London
Frederickson, Alice C.....Willmar
§ Gaebe, Milton B.....Clara City
Giere, Silas W.....Benson
§ Gilman, Lloyd C.....Willmar
§ Griffin, Richard P.....Benson
§ Guy, Jack H.....New London
§ Helwig, Karl L., Jr.....Kerkhoven
§ Hinderaker, Harris P.....Willmar
§ Hinz, Walter E.....Willmar
†§Hodapp, Robert V.....Minneapolis
§ Holm, Donald F.....Benson
§ Houts, Joseph C.....Dassel
Jacobs, Douglas L.....Willmar
†§Jacobs, Johannes C.....Willmar
§ Johnson, Marvin W.....Dassel
§ Kaufman, Edward J.....Appleton
McCarthy, Austin M.....Willmar
Macklin, William E., Jr.....Willmar
§ Meinert, John K.....Willmar
§ Michels, Roger P.....Willmar
§ Nelson, Robert H.....Benson
† O'Connor, Daniel C.....Eden Valley
§ Olson, Gregory M.....Litchfield
§ Opsahl, Lawrence J.....Willmar
§ Peterson, Willard E.....Willmar
† Porter, Oliver M.....Minneapolis
§ Proeschel, Ray K.....Willmar
§ Rorem, Joseph A.....Appleton
§ Ruchie, Warren H.....Willmar
Rygh, Harold N.....Atwater
Schnell, Frederick S.....Litchfield
Skaife, William F.....Benson
† Solsem, Frederick N. S.....Spicer
§ Wagner, Norman W.....Benson
‡ Williams, Francis R.....Duluth
Wilmot, Cecil A.....Litchfield
Wilmot, Harold E.....Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Lyon and Lincoln Counties
Regular meetings, 6-week period in Spring and Fall
Annual meeting, 4th Tuesday in October
Number of Members—30

President
GULDSETH, GUSTAV J.....Hendricks
Secretary
HEDENSTROM, PHILIP C.....Marshall

§ Bodaski, Albert A.....Tyler
Casey, John J.....Ivanhoe
§ Eckdale, John E.....Marshall
§ Engwall, Richard.....Ivanhoe
§ Ferguson, William C.....Walnut Grove
§ Ford, Burton C.....Marshall
Goldstein, Alan.....Minneota
† Gray, Frank D.....Marshall
§ Guldseth, Gustav J.....Hendricks
§ Hedenstrom, Philip C.....Marshall
§ Hermanson, Peter E.....Hendricks
† Hoidale, Andrew D.....Tracy
§ Johnson, C. Percy.....Tyler
§ Kreuzer, Titus C.....Marshall
§ Larson, Milo H.....St. Peter
§ Lee, Norman J.....Tracy
§ Monson, Leonard J.....Canby
§ Murphy, Joseph E.....Marshall
§ Myers, John W.....Canby
§ Olson, Robert T.....Canby
§ Peterson, Kenneth A.....Marshall
§ Remsberg, Robert R.....Tracy
Smith, Lloyd A.....Willmar
§ Taintor, Ronald W.....Marshall
Thill, Leonard J.....Balaton
§ Thompson, Carl O.....Hendricks
§†Vadheim, Alfred L.....Brookings, So. Dak.
§†Valentine, Walter H.....Tracy
§ Workman, Warner G.....Tracy
†§Yaeger, Wilbert W.....Marshall

McLEOD COUNTY MEDICAL SOCIETY

McLeod County
Regular meetings, third Thursday of each month
Annual meeting, third Thursday in December
Number of Members—22

President
HOWELL, MILTON M.....Glencoe
Secretary
TRUESDALE, CLARK W.....Glencoe

§ Bretzke, Carl O.....Hutchinson
§ Brink, Donald M.....Hutchinson
Carroll, John J.....Winsted
§ Chervenak, William A. .....Winsted
§ Griebie, Grant L.....Brownton
§ Howell, Milton M.....Glencoe
§ Huebert, Dan W.....Hutchinson
§ Jensen, Alvin M.....Brownton
§ Lippmann, Elmer W.....Hutchinson
§ McCoy, Donald E.....Glencoe
§ McNeil, Maurice R.....Glencoe
§ Navratil, Donald R.....Glencoe
§ Neumaier, Arthur.....Glencoe
§ Peterson, Kenneth H.....Hutchinson
† Rayner, Ralph R.....St. Paul
Sahr, Walter G. C.....Hutchinson
*†Scholpp, Otto W.....Hutchinson
§ Selmo, Joseph D.....Norwood
§ Sheppard, Charles G.....Hutchinson
§ Smith, George R.....Hutchinson
§ Smyth, John J.....Lester Prairie
§ Truesdale, Clark W.....Glencoe

MOWER COUNTY MEDICAL SOCIETY

Mower County
Regular meetings, last Friday of the month
Annual meeting, November
Number of Members—41

President
LOMMEN, PETER A., Jr.....Austin
Secretary
ROSENTHAL, F. HAROLD.....Austin

§ Anderson, David P., Jr.....Austin
§ Anderson, Harold J.....Austin
§ Anderson, Wallace R.....Austin
§ Barber, Tracy E.....Austin
§ Cronwell, Bernhard J.....Austin
Elliott, Harold J.....Hayfield
§ Fisch, Herbert M.....Austin
§ Flanagan, Leonard G.....Austin
§ Hagen, John D.....Austin
† Havens, John G. W.....Austin
† Hegge, Olav H.....Austin
† Hertel, Garfield E.....Austin
§ Hesla, Inman A.....Austin
§ Leck, Paul C.....Austin
§ Lommen, Peter A.....Austin
§ Lommen, Peter A., Jr.....Austin
† McKenna, Elizabeth M.....San Francisco, Calif.
† McKenna, Jay K.....Austin
† Melzer, George R.....Lyle
§ Miller, Herman.....Austin
§ Nesse, James A.....Austin
§ Osborn, Donald O.....Austin
Patten, John C.....Austin
§ Paulus, Harold E.....Austin
§ Peterson, Stanley C.....Austin
§ Peterson, W. H.....Austin
§ Roberts, George A.....Austin
§ Robertson, Paul A.....Austin
§ Rosenthal, F. Harold.....Austin
Schneider, Paul J.....Adams
Schwartz, Carl A.....Austin
§ Seery, Thomas M.....Austin
Sheedy, Chester L.....Austin
Smythe, Lowell.....Austin
§ Stahl, George W.....Austin
§ Taufic, Mansur.....Austin
§ Thomson, James M.....Austin
Todd, John C.....Austin
§ Twiggs, Leo F.....Austin
§ Van Cleve, Horatio P., Jr.....Austin
§ Wright, Robert R.....Austin

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Nicollet and Le Sueur Counties
Regular meetings, first Monday of alternate months
Annual meeting, December
Number of Members—26

President
OLMANSON, E. G.....St. Peter
Secretary
THOMPSON, A. H.....St. Peter

† Ager, Ernest A.....Minneapolis
Bergeron, Dale A.....Le Sueur
† Branham, Donald S.....Deer Park, Wis.
§ Canfield, Wayne W.....St. Peter
§ Curtis, Rauen A.....LeCenter
† Erickson, Swan.....Los Angeles, Calif.
Gislason, Solveig T.....St. Peter
§ Gridley, John W.....Arlington
§ Grimes, Burton P.....St. Peter
§ Haes, Julius E.....St. Peter
§ Hiniker, Peter J.....Le Sueur
Huffington, Herb L., Jr.....Waterville
† Kabrick, Ola A.....St. Peter
Kath, Reinhard H.....Arlington
§ Lenander, Mellvin E. L.....St. Peter
§ Limbeck, Donald A.....Le Sueur
Olmanson, Edmund G.....St. Peter
§ Olmanson, Myron D.....St. Peter
§ Schulberg, Verne A.....Gaylord
§ Sjostrom, Lawrence E.....St. Peter
§ Sonnesyn, Nels N.....Le Sueur
§ Strathern, Carleton S.....St. Peter
† Strathern, Fred P.....St. Peter
§ Thompson, A. Henry.....St. Peter
* Traxler, J. Felix.....Henderson
§ Wohlrabe, Clarence F.....North Mankato

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail, and Wilkin Counties
Regular meetings, March, June and September
Annual meeting, December
Number of Members—66

President
SANDERSON, DAVID J.....Fergus Falls
Secretary
JOHNSON, RAY A.....Fergus Falls

Baker, Jeannette L.....Fergus Falls
Baker, Norman.....Fergus Falls
§ Bateman, Clarence.....Breckenridge
† Blakey, Adam R.....Osakis
§ Boline, Clifford A.....Battle Lake
§ Cain, James H.....Alexandria
Campbell, Dennis V.....Fergus Falls
§ Carlson, Carl E.....Alexandria
Carlson, Homer J.....Pelican Rapids
Clifford, George W.....Alexandria
§ Coleman, Edward L.....Fergus Falls
§ Daehlin, Rolf.....Fergus Falls
§ Doms, Vernon A.....Elbow Lake
Eddy, Richard L.....Alexandria
§ Emerson, Edwin E.....Osakis
Estrem, Ralph L.....Fergus Falls
Estrem, Robert D.....Fergus Falls
Geiser, Peter M.....Alexandria
§ Hamlon, John S.....Fergus Falls
Hanson, Everett C.....New York Mills
§ Heegaard, William G.....Alexandria
†§ Heiberg, E. A.....Fergus Falls
§ Helseth, Hovald K.....Fergus Falls
Hom, Leong, Y. W.....Battle Lake
Hunt, William.....Fergus Falls
§ Jacobson, Clifford W.....Breckenridge
Johnson, Ray A.....Fergus Falls
§ Kavern, Jay L.....Henning
§ Kippen, Neil.....Breckenridge
§ Korda, Henry A.....Pelican Rapids
Larson, Arthur M.....Fergus Falls
Larson, Dorette W.....Moose Lake
† Leibold, Herbert H.....Parkers Prairie
Love, Frederick A.....Carlos
Lu, Cheng-en.....Fergus Falls
§ Lund, Carl J. T.....Fergus Falls
May, Robert B.....Fergus Falls
† Mortenson, Nels G.....Minneapolis
§ Mouritsen, Glenn J.....Fergus Falls
§ Nelson, Roy A.....Fergus Falls
Nelson, Wilburn O. B.....St. Peter
§ Ness, Richard A.....Fergus Falls
§ O'Brien, Louis R.....Breckenridge
Ostergaard, Erling.....Evansville
Parson, E. Lillian B.....Elbow Lake
Parson, Lester R.....Elbow Lake
† Patterson, William L.....Fergus Falls
†§ Paulson, Theodore S.....Fergus Falls
Perkins, Douglass E.....Alexandria
Reinhardt, James H.....Alexandria
Rockwood, Philo H.....Fergus Falls
§ Sanderson, David J.....Fergus Falls
† Satersmoen, Theodore.....Pelican Rapids
§ Sather, Edgar R.....Alexandria
Schamber, Walter F.....Parkers Prairie
Schoeneberger, P. B.....Perham
§ Sethre, Arthur E.....Fergus Falls
§ Shaver, Ward.....Fergus Falls
Singbeil, J. H.....Breckenridge
Stahn, Louis H.....Fergus Falls
§ Stemsrud, Harold L. .....Alexandria
Syverson, Leslie A.....Fergus Falls
§ Tangquist, Edwin J.....Alexandria
Warner, James J.....Perham
§ Wasson, Loren F.....Alexandria
Webb, Alexander G., Jr.....Hoffman

RAMSEY COUNTY MEDICAL SOCIETY

Ramsey County
Regular meetings, last Monday each month except June, July and August
Annual meeting in January
Number of Members—525

President
GARDNER, WALTER P.....St. Paul
Secretary
SKINNER, ABBOTT.....St. Paul
Executive Secretary
OLSON, MRS. ELEANOR.....St. Paul

Abrams, Alexander, Jr.....St. Paul
§ Adair, Albert F., Jr.....St. Paul
Adams, Harold R.....St. Paul
† Ahrens, Albert E.....St. Paul
Ahrens, Robert M.....St. Paul
§ Alden, John F., Jr.....St. Paul
Alton, Donald G.....St. Paul
Ambrus, Laszlo.....St. Paul
§ Amerongen, W. W.....St. Paul
Anderson, Margaret C.....St. Paul
§ Arnquist, Andrew S.....St. Paul
Arny, Frederick P.....St. Paul
§ Arzt, Philip K.....St. Paul
§ Aurelius, J. Richards.....St. Paul
§ Ausman, Duane R.....St. Paul
§ Austrian, Sol.....St. Paul
§ Babb, Frank S.....St. Paul
*Baer, Walter.....St. Paul
§ Baird, Raymond L.....St. Paul
Balcome, Milton M.....St. Paul
Barnett, Joseph M.....St. Paul
† Barsness, Nellie O. N.....St. Paul
Bauer, Eugene L.....St. Paul
*†§ Beals, Hugh.....LaJolla, Calif.
§ Beck, Charles J.....North St. Paul
§ Beech, Raymond H.....St. Paul
§ Beek, Harvey O.....St. Paul
§ Beer, John J.....St. Paul
* § Bell, C. Curry.....St. Paul
§ Bellomo, James.....St. Paul
§ Benepe, James L.....St. Paul
Benthack, Elaine M.....St. Paul
Bernhisel, Harris G.....St. Paul
Bernier, M. J.....North St. Paul
§ Bernstein, William C.....St. Paul
§ Bicek, Joseph F.....St. Paul
† Binger, Henry E.....Phoenix, Ariz.
§ Bjornson, Robert G. B.....St. Paul
Black, Earl J.....St. Paul
Blackburn, Henry W., Jr.....St. Paul
§ Blomberg, William R.....St. Paul
§ Blumberg, Henry B.....St. Paul
† § Bock, Rolland A.....St. Paul
§ Bonello, Frank J.....St. Paul
§ Borg, Joseph F.....St. Paul
† Bouma, Lewis R.....St. Paul
Bouthilet, Florence J.....St. Paul
† Bray, Elwyn R.....St. Paul
§ Briggs, John F.....St. Paul
§ Broadie, Thomas E.....St. Paul
§ Brodie, Walter D.....St. Paul
Brown, Ian A.....St. Paul
Brown, James E., Jr.....St. Paul
† Brown, John C.....Los Gatos, Calif.
§ Bulinski, Theodore J.....St. Paul
§ Burch, Edward P.....St. Paul
Burklund, Edwin C.....St. Paul
Burlingame, David A.....St. Paul
§ Burmeister, Richard O.....St. Paul
† Burns, Robert M.....St. Paul
Burton, Carl G.....St. Paul
§ Bush, Robert P.....St. Paul
§ Busher, Herbert H.....St. Paul
§ Cain, Clark L.....St. Paul
Calin, Stanford H.....St. Paul
Callahan, Francis F.....St. Paul
Canine, James L.....So. St. Paul
§ Carley, Walter A.....St. Paul
Cederleaf, Cherry B.....Mahtomedi
Chadbourn, Charles R.....St. Paul
†§ Chatterton, Carl C.....St. Paul
§ Christiansen, Andrew.....St. Paul
Clark, Henry B., Jr.....Minneapolis
§ Cochrane, Byron B.....St. Paul
Coddon, Walter D.....St. Paul
§ Cohen, Ellis N.....St. Paul
§ Colby, Woodard L.....St. Paul
Cole, Wallace H.....St. Paul
§ Coleman, John B.....St. Paul
† Collie, Henry G.....St. Petersburg, Fla.
§ Connolly, Coleman J.....St. Paul
Connolly, Joseph P.....So. St. Paul
Connor, Charles E.....St. Paul
§ Cook, C. Kenneth.....St. Paul
§ Cooper, Charles C.....St. Paul
† Countryman, Roger S.....Saratoga, Calif.
§ Craig, David M.....St. Paul
Crowley, James H.....St. Paul
§ Crudo, Vincent D.....St. Paul
Crump, James W.....St. Paul
§ Culver, Lucian G.....St. Paul
§ Cumming, E. Dale.....St. Paul
Dahl, Diane A.....Mahtomedi
§ Davis, Edward V.....St. Paul
Dawson, James R.....St. Paul
Decker, Charles H.....St. Paul
§ Derauf, Benjamin I.....St. Paul
§ Derauf, Donald E.....St. Paul
§ Deters, Donald C.....St. Paul
§ Drake, Carl B.....St. Paul
Dunn, Robert C.....St. Paul
Dyrdal, Paul J.....St. Paul
§ Earl, George A.....St. Paul
§ Earl, John R.....St. Paul
Edwards, Joseph W.....St. Paul
Edwards, Lloyd G.....St. Paul
§ Edwards, Thomas J.....St. Paul
Eelkema, Herman H.....St. Paul
§ Eginton, Charles T.....St. Paul
Emerson, Edward C.....St. Paul
§ Emmons, Robert W.....St. Paul
§ Endress, Edward K.....St. Paul
§ Enroth, Oscar E.....St. Paul
† Ernest, George C. H.....Lakeland, Fla.
§ Ersfeld, Murray P.....St. Paul
† Eshelby, E. C.....St. Paul
Falk, Abraham.....St. Paul
Farkas, John V.....St. Paul
§ Fee, John G.....St. Paul
§ Felder, Davitt A.....St. Paul
§ Felion, Arthur J.....St. Paul
§ Fesler, Harold H.....St. Paul
Field, Anthony H.....Farmington
§ Fink, Daniel L.....St. Paul
§ Fischer, Robert F.....St. Paul
§ Fisher, Dan W.....St. Paul
§ Flanagan, Harold F.....St. Paul
§ Flannery, Hubert F.....St. Paul
§ Flom, Reynold P.....St. Paul
Flom, Robert S.....St. Paul
§ Flynn, Louis L., Jr.....St. Paul
§ Flynn, Robert A.....St. Paul
† Fogarty, Charles W.....St. Paul
§ Fogarty, Charles W., Jr.....St. Paul
§ Fogelberg, Emil J.....St. Paul
§ Foley, Frederic E. B.....St. Paul
Forsythe, James R.....St. Paul
§ Fox, LeRoy J.....St. Paul
§ Freeman, Charles D., Jr.....St. Paul
Fritz, Wallace L.....St. Paul
§ Froats, Charles W.....St. Paul
§ Fuller, Benjamin F.....St. Paul
§ Galligan, John J.....St. Paul
§ Garbrecht, Arthur W.....St. Paul
§ Gardner, Walter P.....St. Paul
Garrow, Douglas M.....St. Paul
§ Gehlen, Joseph N.....St. Paul
Gibbs, Edward C.....St. Paul
§ Gillespie, Delmar R.....St. Paul
§ Gilsdorf, Donald A.....St. Paul
§ Gleason, Wallace A.....St. Paul
Golden, Jules S.....St. Paul
§ Goldsmith, Joseph W.....St. Paul
†§ Goltz, Edward V.....St. Paul
Goodman, Ernest.....St. Paul
Grant, Hendrie W.....St. Paul
*†§ Gratzek, Thomas.....St. Paul
*§ Grau, Robert K.....St. Paul
Gray, Edward F.....White Bear Lake
Guenther, Dean E.....W. St. Paul
Hagen, Paul S.....St. Paul
§ Hakanson, Erick Y.....St. Paul
§ Hall, Barnard.....St. Paul
§ Hammes, Ernest M.....St. Paul
§ Hammes, Ernest M., Jr.....St. Paul
§ Hannon, Donald W.....St. Paul
† Harbaugh, John T.....Minneapolis
§ Harmon, Gaius E.....St. Paul
Harris, John E.....Minneapolis
§ Hartfiel, William F.....Minneapolis
Hartig, Marjorie.....Minneapolis

§ Hauser, Victor P. ... Minneapolis
§ Hayes, Albert F. ... Minneapolis
§§ Heck, William W. ... Minneapolis
Hedenstrom, Frank G. ... Minneapolis
Hedenstrom, Paul H. ... St. Paul
Hedlund, Charles J. ... St. Paul
Heilig, William R. ... St. Paul
Henderson, Arthur J. G. ... North St. Paul
§ Hengstler, William H. ... St. Paul
§ Herman, Samuel M. ... St. Paul
* Herrmann, Edgar T. ... St. Paul
Hertz, Myron J. ... St. Paul
§ Hilger, Jerome A. ... St. Paul
Hilger, Laurence D. ... St. Paul
§ Hilker, Marcus D. ... St. Paul
Hiniker, Louis P. ... St. Paul
§§ Ho, Shu Kang ... St. Paul
§§ Hochfilzer, John J. ... St. Paul
Hodgson, Jane E. ... St. Paul
† Holcomb, O. William ... St. Paul
Hollinshead, William H. ... St. Paul
§ Holmen, Robert W. ... St. Paul
§§ Holt, John E. ... St. Paul
Hopkins, G. Wendell ... St. Paul
Houlton, William H. ... St. Paul
Howard, Merrill A. ... St. Paul
§ Howe, Newell W. ... St. Paul
§§ Hullsiek, Harold E. ... St. Paul
Hunter, Murray H. ... Farmington
§§ Hunter, Samuel W. ... St. Paul
§§§ Hurwitz, Milton W. ... St. Paul
§§ Husebye, Kjeld O. ... St. Paul
† Ide, Arthur W. ... Palm Beach, Fla.
Ikeda, Kano ... St. Paul
Jackson, William C. ... St. Paul
§ James, Ellery M. ... St. Paul
§§§§ James, John W. ... St. Paul
Janssen, Martin E. ... St. Paul
§† Jarvis, Bruce W. ... St. Paul
† Jarvis, Charles W. ... St. Paul
Jarvis, Marilyn A. ... St. Paul
§§§ Jastram, Rupert M. ... St. Paul
§§§ Johanson, Waldemar G. ... St. Paul
Johnson, Carl E. ... St. Paul
Johnson, Carolyn A. ... St. Paul
§§ Johnson, Herbert W. ... St. Paul
Johnson, Morris B. ... St. Paul
§§ Johnson, R. J. ... St. Paul
§† Jones, E. Mendelssohn ... St. Paul
Joseph, Arnold H. ... St. Paul
§ Kamman, Gordon R. ... St. Paul
Kaplan, David H. ... St. Paul
Karon, Everett H. ... St. Paul
Karon, Irvine M. ... St. Paul
§ Kasper, Eugene M. ... St. Paul
Katz, Louis J. ... Long Beach, Calif.
Keefe, Rolland E. ... St. Paul
§§§ Kelly, Albert C. ... St. Paul
§§§§ Kelly, Edward H. ... St. Paul
Kelsey, Chauncey M. ... St. Paul
§§§§§ Kenefick, Emmett V. ... St. Paul
§§§ Kenyon, Thomas J. ... St. Paul
†§ Kesting, Herman ... St. Paul
† King, George L. ... Hudson, Wis.
§§§§ Knutson, Gerhard E. ... St. Paul
Knutson, Robert C. ... St. Paul
Kodres, Nina ... St. Paul
Koza, Donald W. ... St. Paul
§§§ Krezowski, Thomas K. ... St. Paul
§§§ Kugler, Alex A. ... St. Paul
§§§§ Kuske, Albert W. ... St. Paul
§§§§ Kusske, Bradley W. ... St. Paul
§§§§ Kusske, Douglas R. ... St. Paul
§ Lannin, Bernard G. ... St. Paul
§§§§ Lannin, Donald R. ... St. Paul
§§§ Larrabee, Walter F., Jr. ... St. Paul
Larson, Eva-Jane Ostergren ... St. Paul
Larson, James T. ... So. St. Paul
§ Larson, Kenneth R. ... St. Paul
Larson, Martin L. ... St. Paul
Larson, Wyllis G. ... St. Paul
Laszewski, Franz von Zelberschwecht ... St. Paul
Lawton, James J., Jr. ... St. Paul
†§ Leahy, Bartholomew ... St. Paul
§ Leick, Richard M. ... St. Paul
Leitch, Archibald ... St. Paul
§ Lepak, John A. ... St. Paul
† Lerche, William ... Cable, Wis.
§ Lessard, Richard J. ... St. Paul
Leven, N. Logan ... St. Paul
§ Leverenz, Carleton W. ... St. Paul
Levitt, George X. ... St. Paul
Lewis, Joyce S., Jr. ... St. Paul
§§§§§ Lick, Charles L. ... St. Paul
§§§§§ Lick, Louis C. ... St. Paul
§§§§§ Lick, William J., Jr. ... St. Paul
§§§§§ Lien, Richard J. ... St. Paul
† Lightbourn, Edgar L. ... Hastings
§ Lilleberg, Norbert J. ... St. Paul
§§ Lindell, Robert E. ... St. Paul
Lippman, Hyman S. ... St. Paul
Litkewitsch, Helene ... St. Paul
§ Loken, Selmer M. ... So. St. Paul
Lowe, Alexander D. ... So. St. Paul
§ Lowe, Earl R. ... So. St. Paul
Lowe, Thomas A. ... So. St. Paul
§§§ Lundholm, Arthur M. ... Harris
§ Lynch, Francis W. ... St. Paul
§§§ *McCabe, James S. ... St. Paul
§§§ McCain, Donovan L. ... St. Paul
* McCarthy, Joseph J. ... St. Paul
†* McClanahan, James H. ... White Bear Lake
McClanahan, Thomas S. ... White Bear Lake
McClellan, Robert J. ... St. Paul
McCloud, C. Naumann, Jr. ... St. Paul
McDaniel, Samuel P. ... Lakeville
§§§ McEwan, Alexander ... St. Paul
§§§ McGroarty, Brian J. ... St. Paul
McKenzie, Eva E. ... St. Paul
§§§ McNeil, J. A. ... St. Paul
§§§ Mac Cornack, Robert L., Jr. ... St. Paul
Maclean, Lloyd D. ... St. Paul
Mackoff, Sam M. ... Phoenix, Ariz.
Madland, Robert S. ... St. Paul
§§§§§ Malerich, J. Anthony ... St. Paul
§§§§§ Malerich, J. Anthony, Jr. ... St. Paul
§§§§§ Manlove, Charles H., Jr. ... St. Paul
Marks, Roger W. ... St. Paul
§ Martin, Dwight L. ... St. Paul
†§ Martineau, Joseph L. ... St. Paul
Mateo, Guillermo ... St. Paul
Matthews, James H. ... Minneapolis
§§§§§§§§§ Mazzitello, William F. ... St. Paul
Mears, Burtis J. ... St. Paul
Medelman, John P. ... St. Paul
Melancon, Joseph F. ... St. Paul
Menold, William F. ... St. Paul
Merrick, Robert L. ... St. Paul
§ Michienzi, Leonard J. ... St. Paul
Midboe, Gilbert ... Forest Lake
§ Miller, Albert G. ... St. Paul
Miller, William T. ... St. Paul
Miller, Zondal R. ... St. Paul
§§§ Milnar, Frank J. ... St. Paul
§§§ Mishek, Charles J. ... St. Paul
Mitchell, George S. ... St. Paul
§ Moga, John A. ... St. Paul
Molander, Herbert A. ... St. Paul
Moller, Jurgen ... St. Paul
§§§§† Monahan, Robert H. ... St. Paul
Mooney, Robert D. ... St. Paul
§§§† Moquin, Marie A. ... St. Paul
† Moren, J. Adelaide ... White Bear Lake
Moriarty, M. Berenice ... St. Paul
Moriarty, Cecile R. ... St. Paul
§ Muller, A. Eugene ... North St. Paul
§ Mundahl, Harold R. ... St. Paul
§ Murphy, Jack T. ... St. Paul
Murray, Roger C. ... St. Paul
Nagle, Duane W. ... Fargo, No. Dak.
§ Nash, Leo A. ... St. Paul
Neibergs, Lidija I. ... St. Paul
Neibergs, Pauls ... St. Paul
§§§ Nelson, Loren E. ... St. Paul
§† Nelson, Louis A. ... St. Paul
§§‡ Nelson, Louis A., Jr. ... St. Paul
Nielsen, Andrew A. ... APO, New York City
Nimlos, Kenneth O. ... St. Paul
† Nimlos, Lenore O. ... St. Paul
§§§§§ Noble, John F. ... St. Paul
Noble, J. Lawrence ... St. Paul
§ Norman, David D. ... St. Paul
Nuebel, Charles J. ... St. Paul
Nye, Katherine A. ... St. Paul
Nye, Lillian L. ... St. Paul
§ O'Brien, J. C. ... St. Paul
O'Kane, Thomas W. ... St. Paul
§§§ O'Malley, Valentine ... St. Paul
§§§† O'Reilley, Bernard E. ... St. Paul
§§§† Ockuly, Orville E. ... St. Paul
§§§† Ogden, Warner ... St. Paul
† Ohage, Justus ... St. Paul
§§§§§ Olsen, Ralph L. ... St. Paul
§§§§§ Ostergren, Edward W. ... St. Paul
§§§§§ Ouellette, Alfred J. ... St. Paul
§§§§§ Owens, Frederick M., Jr. ... St. Paul
§ Palm, Neil M. ... St. Paul
Paulson, Elmer C. ... St. Paul
§ Paulson, Wallace J. ... St. Paul
Pearson, Fritz R. ... St. Paul
§§§ Pearson, Malcolm M. ... St. Paul
§§§ Peck, Willard R. ... St. Paul
Pedersen, Arthur H. ... St. Paul
Peterson, David B. ... St. Paul
§§§§§ Peterson, Donald H. ... St. Paul
§§§§§ Peterson, Edward A. ... St. Paul
§§§§§ Peterson, Harold O. ... St. Paul
Peterson, Joel L. E. ... St. Paul
§ Peterson, John A. ... St. Paul
Peterson, Roy L. ... White Bear Lake
Phillips, Leonard ... St. Paul
§ Plotke, Harry L. ... St. Paul
Polski, Paul G. ... So. St. Paul
§§§ Post, Edmund A. ... St. Paul
§§§ Prentice, Walter B. ... St. Paul
§ Proud, Harry S. ... St. Paul
Quattlebaum, Frank W. ... St. Paul
§ Raaen, Olaf J. ... St. Paul
Rabcevich, Anatole ... St. Paul
§ Ralph, James R. ... St. Paul
Ramlow, Ralph M. ... St. Paul
† Ramsey, Walter R. ... St. Paul
Rasmussen, Ramby C. ... St. Paul
§§§§§§ Raths, Otto N., Jr. ... St. Paul
§§§§§§ Ravits, Harold G. ... St. Paul
§§§§§§ Rea, Charles E. ... St. Paul
§ Reid, James W. ... So. St. Paul
Reif, Robert W. ... White Bear Lake
Reitmann, John H. ... Hastings
Richards, Albert M. ... St. Paul
Richards, Ernest T. F. ... St. Paul
§ Richardson, Edward J., Jr. ... St. Paul
Rick, Paul F. W. ... St. Paul
Rinkey, Eugene ... St. Paul
Ripple, Rudolph J. ... St. Paul
§§§§§§ Ritchie, Wallace P. ... St. Paul
§§§§§§ Ritt, Albert E. ... St. Paul
§§§§§§ Roach, Donald E. ... St. Paul
§§§§§§ Robbins, Mason C. ... St. Paul
Rolig, David H. ... St. Paul
§§§§ Rollie, Orris O. ... St. Paul
§§§§ Rosenthal, Robert ... St. Paul
Rossing, Robert G. ... St. Paul
§ Roth, George C. ... St. Paul
†§ Rothschild, Harold J. ... St. Paul
§§§§§§ Rowe, Clarence J., Jr. ... St. Paul
§§§§§§ Roy, Philemon C. ... St. Paul
† Ruhberg, George N. ... Santa Barbara, Calif.
§§§§§§§ Rukavina, John G. ... St. Paul
§§§§§§§ Rushay, Arthur J. ... St. Paul
§§§§§§§ Rusterholz, Alan P. ... St. Paul
§† Ryan, John J. ... St. Paul
§§§§§§§ Ryan, Joseph M. ... St. Paul
§§§§§§§ Sarnecki, M. M. ... St. Paul
§† Satterlund, Victor L. ... New Richmond, Wis.
§† Schmidtke, Reinhardt L. ... St. Paul
§† Schoch, Robert B. J. ... St. Paul
Schons, Edward ... St. Paul
Schroeckenstein, Hugo F. ... St. Paul
†§ Schuldt, Frederick C. ... St. Paul
† Schulze, Albert G. ... St. Paul
§§§§§§§ Schwyzer, Hanns C. ... St. Paul
Schwyzer, Marguerite ... St. Paul
§§§§§§§ Scott, Eugene E. ... St. Paul
§§§§§§§ Seifert, Donald R. ... St. Paul
Sekhon, Mohan S. ... St. Paul
§ Sells, Richard J. ... North St. Paul
Setzer, Hobert J. ... St. Paul
Shannon, William R. ... St. Paul
§§§ Shelander, Marcus I. ... St. Paul
§† Shellman, John J. ... Pacific Palisades, Calif.
Siegel, Clarence ... St. Paul
§§§§§§§ Simons, Leander T. ... St. Paul
Singer, Benjamin J. ... St. Paul
§§§§§§§ Skinner, Abbott ... St. Paul
§† Skinner, Harvey O. ... St. Paul
† Skworcow, George ... Minneapolis
Smiley, Donald P. ... St. Paul
§§§§§§§ Smisek, Elmer A. ... St. Paul
Smith, Vernon D. E. ... St. Paul
§§§§§§§ Snyder, George William ... St. Paul
Sohlberg, Olof I. ... St. Paul
§§§§§§§ Sommerdorf, Vernon L. ... St. Paul
§§§§§§§ Sommers, Ben ... St. Paul
§§§§§§§ Sorem, Milton B. ... St. Paul
Soucheray, Philip H. ... St. Paul
§§§§§§§ Souster, Benjamin B. ... St. Paul
§§§§§§§ Sowada, Ernest J. ... St. Paul
§§§§§§§ Sperl, Michael P., Jr. ... St. Paul
§§§§§§§ Sprafka, Gregory ... St. Paul
§§§§§§§ Sprafka, Joseph L. ... St. Paul
§§§§§§§ Steinberg, Charles L. ... St. Paul
§§§§§§§ Sterner, Donald C. ... St. Paul
§§§§§§§ Sterner, Ernest R. ... St. Paul
§§§§§§§ Sterner, John J. ... St. Paul
§§§§§§§ Stolpestad, Armer H. ... St. Paul
§§§§§§§ Strand, Jack W. ... St. Paul
§§§§§§§ Strate, Gordon E. ... St. Paul
§§§§§§§ Straus, Maurice L. ... St. Paul
§ Strem, Edward L. ... St. Paul
Strickland, Martha J. B. ... St. Paul
§§§§§§§ Sturley, Rodney F. ... St. Paul
Sullivan, William A., Jr. ... Minneapolis
† Swanson, John A. ... St. Paul
§§§§§§§ Swanson, Lawrence J. ... St. Paul
Swanson, Ralph H. ... St. Paul
Swendson, James J. ... St. Paul
Swenson, Donald B. ... St. Paul
Swenson, Paul C. ... St. Paul
§§§§§§§ Tani, George ... St. Paul
§§§§§§§ Teisberg, John E. ... St. Paul
Thompson, Floyd A. ... St. Paul
Thoreson, M. C. Bernice ... So. St. Paul
§§§§§§§ Tiffany, Francis B. ... St. Paul
§§§§§§§ Tifft, Cyril R. ... St. Paul
§§§§§§§ Tongen, Lyle A. ... St. Paul
Travis, James S. ... St. Paul
§ Tregilgas, Harold R. ... So. St. Paul
Tregilgas, Richard B. ... St. Paul

Tveten, Omar A.....St. Paul
§ Ubel, Frank A.....St. Paul
Van Bergen, Frederick H.....Minneapolis
Varco, Richard L.....St. Paul
§ Vaughn, C. Gordon.....St. Paul
Veirs, Dean M.....St. Paul
Veirs, Ruby, J. S.....St. Paul
†§Venables, Alexander E.....Ely
§ Votel, Thomas W.....St. Paul
§ Waas, Charles W.....St. Paul
§ Walker, Arthur E.....St. Paul
§ Wall, James O.....St. Paul
§ Wallinga, Jack V.....St. Paul
§ Walsh, Edward F.....St. Paul
§ Walter, Clarence W.....St. Paul
Warren, Cecil A.....St. Paul
§ Watson, P. Theodore.....St. Paul
§ Watson, William H. A.....St. Paul
§ Watson, William J.....Newport
Watz, Clarence E.....St. Paul
§ Webber, Fred L.....St. Paul
§ Wedes, Deno J.....St. Paul
§ Weis, Benjamin A.....St. Paul
§ Weisberg, Maurice.....St. Paul
§ Wenzel, Gilbert P.....St. Paul
§ Westover, Darrell E.....St. Paul
Wetteland, Thomas F.....West St. Paul
§ Wetzel, Earl V.....St. Paul
† Williams, Arthur B.....St. Paul
§ Williams, Clayton K.....St. Paul
§ Williams, George E.....St. Paul
§ Williams, John A.....St. Paul
Williams, Richard A.....St. Paul Park
Wilson, Fred B.....St. Paul
§ Wilson, J. Allen.....St. Paul
§ Wilson, James V.....St. Paul
† Winnick, Joseph B.....St. Paul
§ Witthaus, Melvyn E.....St. Paul
Wolkoff, H. J.....St. Paul
Word, Harlan L.....St. Paul
Youngren, Everett R.....St. Paul
Zachman, Leo L.....St. Paul
Zagaria, James F.....St. Paul
§ Zimmermann, Bernard.....St. Paul
*†§Zimmermann, Harry B.....St. Paul

RANGE MEDICAL SOCIETY

Koochiching, Itasca, and northern portion of St. Louis County
Regular meetings, 4th Tuesday of the month
Annual meeting, January
Number of Members—113

President
OWENS, BEN P.....Hibbing
Secretary
MAST, FREDERIC L.....Chisholm

†§Adams, Bertram S.....Hibbing
§ Addy, Edward R.....Gilbert
Ahola, Kenneth E.....Hibbing
§ Anderson, Richard W.....Aurora
§ Antonow, Arthur M.....Virginia
Baich, Velemir M.....Coleraine
§ Barnes, Richard E.....Aurora
Barry, George J.....Chisholm
Benell, Otto E.....Virginia
† Binet, Henry E.....Grand Rapids
§ Blackmore, Sidney C.....Biwabik
Bolz, J. Arnold.....Grand Rapids
†§Bonner, John L.....St. Paul
Bowen, Robert L.....Hibbing
§ Braun, Ohrmundt C.....Grand Rapids
§ Brockway, Roger W.....Grand Rapids
Brooks, Leonard J.....Virginia
Bryant, Emmett P.....Hibbing
Byrne, William F.....White Bear
Callan, Joseph A.....Virginia
Cantwell, William F.....International Falls
§ Chermak, Francis G.....International Falls
Ciriacy, Edward W.....Ely
Cope, Hershel B.....Virginia
DeMarais, Lloyd C.....Hibbing
Dobler, Manfred G.....Ely
§ Eiseman, Walter.....Hibbing
Engelstad, Wendell P.....Virginia
§ Erickson, George P.....Hibbing
§ Erickson, Vernon D.....Grand Rapids
Erlanson, A. Cornell.....Hibbing
§ Evensta, John B.....Grand Rapids
Ewens, George B.....Virginia
Ferrell, Clarence R.....Grand Rapids
Flanary, Lawrence M.....Chisholm
§ Flynn, Bernard F.....Hibbing
§ French, Bayard T.....Hibbing
Friedlieb, Oskar P.....Virginia
Gerend, Thomas J.....Virginia
§ Goodman, Charles E.....Virginia
†§Graham, Archibald W.....Chisholm
Grahek, Jack P.....Ely
† Granquist, Richard D.....Minneapolis
Grinley, Andrew V.....Grand Rapids
§ Halper, Bernard.....Hibbing
§ Halverson, Kermit J.....Chisholm
§ Hanover, Ralph D.....International Falls
§ Hansen, Robert E.....Hibbing
Heiam, William C.....Cook
§ Ireland, Gerald W.....Grand Rapids
Jacobson, Clarence.....Chisholm
§ Joffe, Harold H.....Virginia
§ Johnson, Calvin J.....Grand Rapids
§ Johnsrud, Luverne W.....Hibbing
Johnston, H. Wayne.....Virginia
Jolin, Francis M.....Remer
§ Karges, Laurel E.....Grand Rapids
§ Karish, Louis J.....Coleraine
§ Kelly, Robert T.....Grand Rapids
† Knutson, Kenneth R.....Minneapolis
§ Kotchevar, Frank R.....Eveleth
§ Kruger, Elmer L.....Nashwauk
Kundel, Robert Ray.....Ely
Law, Harrison E.....Virginia
McGill, Leon K.....Virginia
McKenna, John J.....Virginia
§ McKenna, Maurice J.....Grand Rapids
§ Malmstrom, John A.....Virginia
§ Mast, Fredric L.....Chisholm
§ Miettunen, John B.....Hibbing
Moller, Theodore P.....Soudan
Morsman, L. William.....Hibbing
§ Muller, John J.....Hibbing
§ Murray, Robert A.....Hibbing
Nakamura, James Y.....Deer River
§ Neff, Walter S.....Virginia
Nelimark, Donald R.....Virginia
§ Nollet, Donald J.....Hibbing
Owens, Ben P.....Hibbing
§ Paciotti, Vincent J.....Hibbing
§ Parker, Wilbert H.....Chisholm
Payne, Richard E.....Virginia
† Pearsall, Robert P.....Virginia
Peterson, Edward N.....Virginia
Pierce, Jack R.....Williamson, W. Va.
Prlina, Isaac M.....Virginia
Raattama, John W.....Nashwauk
§ Rajala, Arnold I.....Grand Rapids
Reed, Paul.....Virginia
§ Richter, David J.....Virginia
§ Rowles, Everett K.....Coleraine
§ Salter, Reginald A.....Virginia
§ Schirber, Martin J.....Grand Rapids
§ Schweiger, Theodore R.....Hibbing
Sekanina, Jan.....Babbitt
Sher, David A.....Virginia
§ Siegel, John S.....Virginia
§ Sinamark, Andrew.....Hibbing
Sisler, Clifford E.....Minneapolis
Snyker, Omer E.....Ely
Stolen, Keith H.....Grand Rapids
† Strathern, Moses L.....Gilbert
† Student, Richard E.....Minneapolis
Summar, M. Thomas.....Virginia
* Sutherland, Harry N.....Ely
Swenson, Floyd J.....Cook
† Swenson, Richard W.....Minneapolis
§ Thouin, Lawrence G.....Hibbing
† Tomhave, Wesley C.....Chicago, Ill.
§ Walter, Frederick H.....International Falls
§ Weir, Matthew J.....Virginia
§ Wilbur, Oscar M., Jr.....Hibbing
§ Will, Charles B.....International Falls
Woodruff, Whitney.....Virginia

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Regular meetings, quarterly
Annual meeting, December
Number of Members—59

President
STADEM, CLIFFORD J.....Twin Valley
Secretary
SATHER, RUSSELL O.....Crookston

§ Anderson, Wallace E.....Clearbrook
§ Behr, Orlo K.....Crookston
§ Berg, Arnold M.....Roseau
Berge, David O.....Roseau
*†Biedermann, Jacob.....Austin
§ Boroson, Hugh N.....Thief River Falls
§ Boyer, George S.....Crookston
† Bratrud, Edward.....Thief River Falls
Brink, Adlai A.....Baudette
§ Cameron, John H.....Crookston
§ Clapp, Hubert D.....Crookston
§ Covey, Kenneth W.....Crookston
§ Dale, Les N.....Red Lake Falls
§ Delmore, John L., Jr.....Roseau
§ Edwards, Robert V.....Crookston
*§Erickson, Eskil.....Halstad
Flancher, Leon H.....Crookston
Foderick, Peter P.....Hallock
§ Greene, Daniel E.....Thief River Falls
Herber, Leo.....Thief River Falls
§ Hirsch, Stanton A.....Crookston
§ Holmstrom, Carle H.....Warren
Janecky, Allen G.....Baudette
§ Jensen, John A.....Crookston
§ Kinkade, Byron R.....Ada
§ Klefstad, Lloyd H.....Greenbush
§ Kostick, William R.....Fertile
§ Loken, Theodore.....Ada
† Lynde, Orrin G.....Los Gatos, Calif.
§ Martin, George B.....Thief River Falls
§ Mercil, William F.....Crookston
§ Mochal, Milo A.....Thief River Falls
Mueller, Donald R.....Bagley
† Nelson, Henry E.....Crookston
Pollman, Stanley E.....Thief River Falls
Potts, L. C.....Warroad
§ Oppegaard, Chester L.....Crookston
§ Pumala, Erven E.....Warren
Reeber, Erick.....Thief River Falls
§ Reff, Alan R.....Crookston
Roholt, Christian L.....McIntosh
§ Roholt, Hartvig B.....Fosston
Sather, Edgar L.....Fosston
§ Sather, George A.....Fosston
Sather, Richard N.....Fosston
§ Sather, Russell O.....Crookston
§ Scheuneman, Allen F.....Warroad
§ Schnabel, Robert F.....Crookston
§ Schossow, George W.....Erskine
§ Skogerboe, Rudolph B.....Karlstad
§ Stadem, Clifford J.....Twin Valley
Starekow, Milton D.....Thief River Falls
§ Stewart, Donald E.....Crookston
§ Thorsgard, Ernest O.....Thief River Falls
§ Thysell, Harold R.....Crookston
§ Uhley, Charles G.....Crookston
§ Van Rooy, George T.....Thief River Falls
§ Wendt, H. Paul.....Thief River Falls
§ Wikoff, Howard M.....Crookston

RENVILLE-REDWOOD COUNTY MEDICAL SOCIETY

Renville and Redwood Counties
Regular meetings, 3rd Tuesday of each month
Annual meeting, December
Number of Members—22

President
INGLIS, WILLIAM H.....Redwood Falls
Secretary
FURR, LEO.....Bird Island

Alcorn, William J.....Wabasso
Alton, Donald G.....St. Paul
§ Anderson, Chester A.....Hector
*§Billings, Ralph.....Franklin
§ Bingham, George.....Bird Island
† Brand, William A.....Redwood Falls
§ Ceplecha, Stanley F.....Redwood Falls
§ Cosgriff, James A.....Olivia
Cosgriff, James A., Jr.....Olivia
§ Diessner, Ardell W.....Redwood Falls
§ Dordal, John.....Sacred Heart
§ Fawcett, Arthur M.....Renville
§ Flinn, James B.....Redwood Falls
† Flinn, Thomas E.....Remer
§ Furr, Leo O.....Bird Island
§ Gustafson, Robert W.....Fairmont
§ Inglis, William.....Redwood Falls
Johnson, Orville H.....Edina
§ Johnson, William E.....Morgan
§ Lenz, Joseph R.....Morton
§ Nelson, Glenn E.....Fairfax
§ Pierce, Robert E.....Renville
† Preisinger, Joseph W.....Renville
§ Strauchler, Jonas.....Belview

RICE COUNTY MEDICAL SOCIETY

Rice County
Regular meetings, 3rd Tuesday of each month
Annual meeting, in October
Number of Members—35

President
SMITH, THORSTEN.....Faribault
Secretary
HAAS, JACK F.....Northfield

§ Bauer, Paul G.....Faribault
§ Beaton, J. Gordon.....Northfield
§ Bruhl, Heinz H.....Faribault
Buesgens, Ralph H.....Waterville
§ Engberg, Edward J.....Faribault
Francis, David W.....Morristown
§ Furlow, William L.....Faribault
§ Good, Roy H.....Northfield
§ Graham, Asa B.....Faribault
§ Haas, Jack F.....Northfield
§ Hanson, John W.....Northfield
† Huxley, Frederick R.....Faribault
Kennedy, George L.....Faribault
§ Kolars, James J.....Faribault
Lende, Norman.....Faribault
Meyer, Frederick C.....Kenyon
Meyer, Paul F.....Faribault
Meyer, Robert P.....Faribault
Moses, Royal R.....Kenyon
Nelson, Ernest J.....Lonsdale
§ Nuetzman, Arthur W.....Faribault
§ Orr, Burton A.....Faribault
Ozolins, Marta.....Faribault
Petersen, Donald H.....Northfield
§ Robilliard, Charles M.....Faribault
Rumpf, Carl W.....Faribault
§ Rysgaard, George N.....Northfield
§ Smith, Thorsten.....Faribault
Speckhals, Robert C.....Faribault
§ Street, Bernard.....Northfield
Studer, Donald J.....Faribault
Traeger, Carl A.....Faribault
§ Weaver, Paul H.....Faribault
§ Wilson, Warren E.....Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Lake and southern portion of St. Louis County
Regular meetings, 2nd Thursday except July and August
Annual meeting, 2nd Thursday in January
Number of Members—201

President
PETERSON, JOHN H.....Duluth
Secretary
THOMAS, JOHN V.....Duluth
Exec. Sec'y.
GILBERT, MRS. MARGARET B.....Duluth

§ Abraham, Arden L.....Duluth
§ Ahrens, Curtis F.....Duluth
§ Asta, Joseph J.....Duluth
† Athens, Alvin G.....Duluth
§ Atmore, William G.....Duluth
§ Aufderheide, Arthur C.....Duluth
§ Backus, Bryon C.....Cloquet
§ Backus, Lloyd B.....Cloquet
§ Backus, Reno W.....Nopeming
§ Bagley, Charles M.....Duluth
Bagley, Elizabeth C.....Duluth
§† Bagley, William R.....Duluth
§ Bakkila, Henry E.....Duluth
§ Balmer, Albert I.....Duluth
§ Bardon, Richard.....Duluth
§ Barker, John D.....Duluth
† Barney, Leon A.....Duluth
§ Barrett, Earl E.....Duluth
§ Bartzen, Peter J.....Duluth
§ Becker, Frederick T.....Duluth
§ Bell, Harry M., Jr.....Duluth
Bepko, Marie K. (Mrs. Puumala).....Cloquet
Berdez, George L.....Duluth
§ Bergan, Robert O.....Duluth
§ Bianco, Anthony J.....Duluth
§ Bloom, Joseph.....Silver Bay
Boman, Paul G.....Duluth
§ Boyer, Sam H.....Duluth
§ Bray, Philip N.....Duluth
† Brooker, Warren J.....Minneapolis
§ Brown, Cyrus C., Jr.....Duluth
§ Buckley, Robert P.....Duluth
§ Butler, John K.....Cloquet
Campaigne, Robert J.....Duluth
§ Christensen, Clarence H.....Duluth
† Chrzan, Donald J.....Iowa City, Iowa
Clark, Elizabeth A. (Mrs. Halbert).....Duluth
§ Clark, Ivan T.....Duluth
§ Coll, James J.....Duluth
† Collins, Arthur N.....Duluth
§ Conley, Francis W.....Duluth
Cooper, Harold G.....Duluth
§ Coventry, William D.....Duluth
§ Cowan, George M.....Duluth
Cranston, Robert W., III.....Duluth
§ Crook, Rudolph L.....Duluth
Davis, William I.....Moose Lake
§ Deutsch, Robert J.....Duluth
§ Dickson, Franklin H., Jr.....Proctor
§ Dwyer, John J.....Duluth
§ Eckman, Philip F.....Duluth
§ Eckman, Ralph J.....Duluth
† Ekblad, John W.....Rock Island, Ill.
§ Eklund, Carl D.....Duluth
§ Elias, Frank J.....Duluth
§ Emanuel, Karl W.....Duluth
Eppard, Raymond M.....Cloquet
§ Fawcett, Keith R.....Duluth
§ Fellows, Manley F.....Duluth
Ferrand, Paula T.....Moose Lake
§ Feuling, John C.....Duluth
§ Fifield, Malcolm M.....Duluth
§ Fischer, Mario M.....Duluth
§ Fisketti, Henry.....Duluth
§ Fuller, Josiah.....Duluth
§ Gillespie, Malcolm G.....Duluth
§ Goldish, Daniel R.....Duluth
§ Goldish, Robert J.....Duluth
§ Goldschmidt, Volker.....Duluth
§ Goodnow, William H.....Duluth
§ Gowan, Lawrence R.....Duluth
§ Grohs, William H.....Duluth
§ Gronquist, Y. K. J.....Duluth
§ Haase, Donald D.....Silver Bay
§ Haavik, John E.....Duluth
Halbert, John J.....Duluth
Halliday, Phillip V.....Duluth
† Haney, Claude L.....Duluth
§ Hanson, Ernest O.....Cloquet
§ Harrington, Vernon A., Jr.....Duluth
†§ Hatch, Walter E.....Duluth
§ Hilding, Anderson C.....Duluth
† Hill, Frederick E.....Riverside, Calif.
† Hirschboeck, Frank J.....Duluth
§ Hoeg, Dwight C.....Duluth
§ Hoff, Herbert O.....Duluth
§ Houkom, Samuel S.....Duluth
Hutchinson, Henry.....Moose Lake
§ Jacobson, Ferdinand C.....Duluth
†§ Jensen, Thorvold J.....Duluth
§ Jeronimus, Henry J.....Duluth
Jessico, Charles M.....Duluth
‡ John, Robert H.....St. Paul
§ Johnson, Karl E.....Duluth
§ Jorgenson, Edward O.....Duluth
§ Juntunen, Roy R.....Duluth
† Kelley, Walter M.....Madison, Wis.
†§ Klein, Harry.....Duluth
§ Klein, William A.....Duluth
§ Knapp, Frank N.....Duluth
§ Knoedler, John P.....Duluth
Kohlbry, Carl O.....Duluth
Kosiak, William.....Two Harbors
Kozberg, Oscar.....Moose Lake
§ Krueger, Victor R.....Nopeming
§ LaBree, Robert H.....Duluth
†§ Laird, Arthur T.....Duluth
Larson, Keith D.....Moose Lake
§ Latterell, Kenneth E.....Duluth
§ Leek, Joseph H.....Duluth
† Lepak, Francis J.....Duluth
Leppo, N. Erkki A.....Duluth
L'Esperance, Bernard F.....Two Harbors
Linke, Charles A.....Duluth
Linke, Clara L.....Duluth
§ Litman, Samuel N.....Duluth
*† McCoy, Mary K.....Duluth
† McDonald, Archibald L.....Duluth
§ McDonald, Owen G.....Duluth
§ McHaffie, Orval L.....Duluth
§ McNutt, John R.....Duluth
§ MacRae, Gordon C.....Duluth
§ Magney, Fredolph H.....Duluth
Martin, Webster C.....Duluth
§ Martin, William B.....Duluth
§ Mayne, Roy M.....Nopeming
† Mead, Charles H.....Duluth
Moe, Thomas.....Moose Lake
§ Moehring, Henry G.....Duluth
§ Monserud, Nels O.....Cloquet
§ Moyer, John B.....Duluth
§ Munger, James E.....Duluth
Munson, Martin S.....Barnum
†§ Nicholson, Murdoch A.....Duluth
§ Nisius, George F.....Duluth
§ Norberg, Carl E.....Cloquet

§ Nutting, Roland E.....Duluth
§ O'Neill, John C.....Duluth
§ Olson, Albert E.....Duluth
§ Olson, Archie O.....Duluth
§ Papermaster, Ralph.....Two Harbors
§ Parson, E. Irvine.....Duluth
§ Pasek, Antone W.....Cloquet
§ Patch, Orien B.....Duluth
§ Pedersen, Roy C.....Duluth
† Pennie, Daniel F.....Duluth
§ Peterson, John H.....Duluth
§ Pollard, William S.....Duluth
§ Power, John E.....Duluth
§ Power, John E., Jr.....Duluth
Puumala, Reino H.....Cloquet
§ Reardon, Andrew E.....Duluth
Reed, Henry H.....Duluth
† Rowe, Olin W.....Duluth
§ Rudie, Peter S.....Duluth
§ Rudie, William D.....Duluth
§ Runquist, John M.....Duluth
Ruth, Bradley R.....Duluth
Ryan, William J.....Duluth
§ Sach-Rowitz, Alvan.....Moose Lake
Sanford, John B.....Duluth
† Sarff, Oliver E.....Duluth
Sax, Milton H.....Duluth
Sax, Simon G.....Duluth
§ Schmid, John F.....Duluth
§ Schneider, Lawrence E.....Duluth
† Schroder, Charles H.....Pottstown, Penna.
§ Seashore, Rosel T.....Duluth
§ Smith, Cyril M.....Duluth
Smith, Wallace R.....Grand Marais
§ Soderberg, Richard J.....Grand Marais
§ Spang, Anthony J.....Duluth
§ Spang, James S.....Duluth
§ Spang, William M.....Duluth
§ Stein, William A.....Duluth
§ Storsteen, Kenneth A.....Duluth
§ Streitz, John M.....Duluth
§ Strewler, Gordon J.....Duluth
§ Swedberg, William A.....Duluth
§ Swenson, Arnold O.....Duluth
§ Teich, Kenneth W.....Duluth
§ Terrell, Bernard J.....Nopeming
§ Tetlie, James P.....Duluth
§ Thomas, John V.....Duluth
Thurn, Roy J.....Duluth
§ Tosseland, Noel E.....Duluth
§ Trautmann, James C.....Duluth
† Tuohy, Edward L.....Santa Barbara, Calif.
§ Tuura, James L.....Duluth
§ Van Puffelen, Paul S.....Duluth
Van Ryzin, Donald J.....Duluth
§ Walder, Harold J.....Duluth
*† Walker, Alfred E.....St. Paul
§ Wallace, Martin O.....Duluth
§ Wells, Arthur H.....Duluth
† Wheeler, Daniel W.....Ft. Lauderdale, Fla.
§ Williams, Bruce F. P.....Duluth
† Winter, John A.....Duluth
§ Wolff, John M.....Duluth
§ Young, Thomas O.....Duluth
§ Zemmers, Roberts.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Scott and Carver Counties
Regular meetings, 4th Thursday of all months, except July and August
Annual meeting, in June
Number of Members—27

President
PHILP, DAVID R.....Watertown
Secretary
SIMMONDS, HARRY N.....Prior Lake

§ Bean, Charles N.....Waconia
§ Bratholdt, James W.....Watertown
† Buck, Frederick H.....Shakopee
§ Cervenka, Charles F.....New Prague
§ Clarke, John W.....Waconia
§ Doherty, Elmer M.....New Prague
†§ Hebeinsen, Milton B.....Carver
Heinz, Ivy B.....Shakopee
§ Heinzerling, Carl R.....Chaska
§ Juergens, Herman M.....Belle Plaine
Kucera, Stanley T.....Northfield
§ Larson, Leighton W.....Waconia
§ Lehrer, Alfred J., Jr.....Montgomery
§ Lukk, Olaf.....Montgomery
*† Martin, Thomas Philip.....Minneapolis
Nagel, Harold D.....Minneapolis
† Novak, Edward E.....New Prague
* Olson, Chester J.....Belle Plaine
§ Pearson, Bror F.....Shakopee
§ Philp, David R.....Watertown
Rieschl, Elizabeth K.....Jordan
§ Schimelpfenig, George T.....Chaska
Simmonds, Harry N.....Prior Lake
§ Simons, Bernard H.....Chaska
Stahler, Paul A.....Jordan
†§ Westerman, Alvin.....Montgomery
† Westerman, Fred C.....Montgomery

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone, and Rock Counties
Regular meetings, Spring and Fall
Annual meeting, October-November
Number of Members—55

President
PATTERSON, HUGH.....Slayton
Secretary
HEIBERG, O. M.....Worthington

*§ Arnold, Elmer W.....Adrian
§ Bader, J. L.....Slayton
Basinger, Harold P.....Windom
§ Basinger, Homer P.....Windom
§ Beckering, Gerrit.....Edgerton
§ Benjamin, Walter G.....Pipestone
§ Bofenkamp, F. William.....Luverne
§ Boone, Ervin S.....Luverne
Boyd, Frank E.....Jasper
Buresh, Kenneth L.....Westbrook
§ Carlson, John V.....Westbrook
§ Christiansen, Harold A.....Jackson
§ Dawson, Lorin D.....Worthington
Dokken, James H.....Windom
Doman, Victor W.....Lakefield
Hallin, Roger P.....Worthington
§ Halloran, Walter H.....Jackson
§ Halpern, David J.....Brewster
Halvorson, Harold C.....Luverne
§ Harrison, Percy W.....Worthington
§ Heiberg, Olaf M.....Worthington
§ Hoyer, Ludolf J.....Windom
Karleen, Bernard N.....Jackson
§ Keyes, Robert W.....Pipestone
§ Kilbride, Edwin A.....Worthington
§ Koenecke, Fred H.....Lakefield
§ Kotval, Russell J.....Pipestone
§ Laikola, Leslie A.....Adrian
§ Lohmann, John G.....Pipestone
§ Maitland, Edwin T.....Jackson
† Manson, Frank M.....Worthington
§ Martin, Albert C.....Luverne
§ Minge, Raymond K.....Worthington
§ Nealy, Donald E.....Adrian
Nywall, Dean D.....Slayton
§ Odland, Donald M.....Luverne
†§ Pankratz, Peter J.....Mountain Lake
§ Patterson, Hugh D.....Slayton
§ Pierson, Roy F.....Slayton
†§ Piper, William A.....Mountain Lake
§ Plucker, Milton W.....Worthington
§ Robinett, Robert W.....Worthington
§ Rohrer, Christian A.....Worthington
§ Rose, John T.....Lakefield
Ryding, Vincent.....Mountain Lake
§ Sawtell, Robert R.....Worthington
§ Schade, Frederick L.....Worthington
§ Schutz, Elmer S.....Mountain Lake
†§ Sherman, Charles L.....Luverne
§ Stam, John.....Worthington
§ Stratte, Harold C.....Windom
Sundberg, Arthur B.....Heron Lake
§ Vix, Vernon A.....Worthington
§ Wells, Walter B.....Jackson
† Williams, Charles A.....Seattle, Wash.

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Stearns and Benton Counties
Regular meetings, third Thursday of month
Annual meeting, December
Number of Members—80

President
THURINGER, CARL B.....St. Cloud
Secretary
MURN, THOMAS G.....St. Cloud

§ Alden, W. Charles.....Kimball
Aulick, Ernest J.....Paynesville
§ Autrey, William A.....St. Cloud
§ Baumgartner, Florian H.....Albany
§ Beuning, John B.....St. Cloud
Bozanich, Milosh S.....St. Cloud
§ Brigham, Charles F., Jr.....St. Cloud
§ Broker, Henry M.....St. Cloud
§ Buscher, Julius C.....St. Cloud
§ Cesnik, Robert J.....Sauk Rapids
§ Clark, Harry B.....St. Cloud
Cleaves, William D.....Sauk Centre
§ Davis, Arthur E., Jr.....St. Cloud
Davidson, William D.....St. Joseph
§ Donaldson, Charles S.....St. Cloud
† DuBois, Julian F.....Sauk Centre
DuBois, Julian F., Jr.....Sauk Centre
§ Evans, Leslie M.....Sauk Rapids
* Fidelman, Norman E.....Foley
§*† Fleming, Thomas N.....St. Cloud
§ Gaida, Joseph B.....St. Cloud
§ Goehrs, Gilman H.....St. Cloud
† Goehrs, Henry W.....St. Cloud
Gorchynski, Orest.....Milaca
Grant, John C.....Sauk Centre
† Haberman, Emil.....Osakis
Halenbeck, Philip L.....St. Cloud
† Handler, Seymour.....Minneapolis
Hedlund, Charles J.....St. Paul
Henry, Clarence J.....Milaca
Henry, Joseph E.....Milaca
†§ Jones, Richard N.....St. Cloud
Keith, Paul J.....Milaca
§ Kelly, James H.....St. Cloud
§ Kelly, John F.....Cold Spring
Kline, Richard F.....St. Cloud
Koenig, Robert P.....St. Cloud
* Kohler, Delphin W.....Tacoma, Wash.
§ Koop, Severin, Jr.....St. Cloud
Kuhlmann, Lawrence B.....Melrose
§ LaFond, Edward M.....St. Cloud
Lenarz, Albert J.....St. Cloud

Leonard, J. Paul....St. Cloud
§ Lindley, Stanley B....St. Cloud
Lindeman, Raymond J....Paynesville
§ Loes, Louis A....St. Cloud
†§McDowell, John P....St. Cloud
† Meyer, Anthony A....Minneapolis
§ Milhaupt, Emmett N....St. Cloud
Mueller, Rudolph B....Richmond
§ Murn, Thomas G....St. Cloud
§ Musachio, Nicholas F....Foley
Myre, Clifford R....Paynesville
§ Neils, Vernon E....Sauk Rapids
Nessa, Curtis B....St. Cloud
Nietfield, Aloys B....Sauk Centre
§ O'Keefe, James P....St. Cloud
§ Olinger, John N....St. Cloud
§ Petersen, Robert T....St. Cloud
§ Phares, Otto C....St. Cloud
§ Raetz, Sylvester J....Maple Lake
§ Reif, Henry J....St. Cloud
§ Richards, William B....St. Cloud
§ Rozycki, Anthony....St. Cloud
Salk, Richard J....Albany
† Sandven, Nels O....Paynesville
§ Schmitz, Everett J....St. Cloud
§ Sisk, Harvey E....St. Cloud
† Stangl, Philip E....St. Cloud
Stiles, Clifford D....Foley
§ Thuringer, Carl B....St. Cloud
Timp, Leo....St. Cloud
§ Undem, Dale W....St. Cloud
Vanderpool, Thomas E....Paynesville
§ Veranth, Leonard A....St. Cloud
*§Walfred, Karl A....St. Cloud
§ Wenner, Waldemar T....St. Cloud
§ Wittrock, Louis H....Watkins
Zachman, Albert H....Melrose
Zeleny, Joseph H....St. Cloud

STEELE COUNTY MEDICAL SOCIETY

Steele County
Regular meetings, 3rd Tuesday of every other month
Annual meeting, January
Number of Members—21

President
ANDERSON, FRANKLIN C....Owatonna
Secretary
DEWERD, ROBERT W....Owatonna

§ Anderson, Franklin C....Owatonna
Arnesen, John F....Owatonna
§ deWerd, Robert W....Owatonna
Dewey, Donald H....Owatonna
§ Fischer, John R....Blooming Prairie
§ Floersch, Adrian J....Owatonna
§ Halvorsen, Daniel K....Owatonna
Hartung, Elmer H....Claremont
§ Henry, Kenneth G....Owatonna
Honath, Donald H....Owatonna
Kulstad, Oscar S....Dodge Center
Lundquist, Curt W....Owatonna
§ McEnaney, James E....Owatonna
§ McIntyre, John A....Owatonna
*†Melby, Benedik....Blooming Prairie
† Morehead, Dewey E....Unknown
§ Olson, Albert J....Owatonna
§ Roberts, Oliver W....Owatonna
§ Schaefer, Joseph F....Owatonna
Stransky, Theodore W....Owatonna
† Wilkowske, Rudolph J....Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard, Lake of the Woods, Morrison, Todd and Wadena Counties
Regular meeting not set
Annual meeting, January
Number of Members—95

President
STEIN, RAYMOND J....Pierz
Secretary
BADEAUX, GEORGE I....Brainerd

§ Adkins, James T....Bertha
§ Aga, John H....Brainerd
§ Anderson, Arden O....Brainerd
Anderson, Werner W....Brainerd
Backer, Gordon L....Rochester
§ Badeaux, George I....Brainerd
Belcher, Royden A....Little Falls
Bender, James H....Brainerd
§ Benson, Alfred H....Little Falls
§ Bissinger, Lester L....Brainerd
§ Bolstad, Owen C....Little Falls
§ Borgerson, Arthur H....Long Prairie
§ Brown, Russell T....Browerville
Burman, Richard E....Aitkin
Cardle, George E....Brainerd
Closuit, Frederick C....Aitkin
Cook, Jay M....Staples
§ Coombs, Carl H....Cass Lake
Craig, C. C....International Falls
§ Crow, Earl R....Ah-Gwah-Ching
† Cushing, Robert L....Walnut Creek, Calif.
Davis, Lloyd T....Wadena
Davis, Luther F....Wadena
DeWeese, Wilford J....Bemidji
Dillenburg, C. J....Little Falls
§ Dodson, Albertus F....Brainerd
Erickson, Alvin O....Long Prairie
§ Fitzsimons, William E....Brainerd
Fortier, George M. A....Little Falls
Franklin, Gordon W....Northome
† Ghostley, Mary C....Santa Ana, Calif.
Griffin, John W., Jr....Bemidji
Grimes, Paul T....Park Rapids
Groschupf, Richard P....Bemidji
Groschupf, Theophilus P....Bemidji
§ Grose, Frederick N....Clarissa
Haugen, Norman R....Park Rapids
Halme, William H....Wadena
Hansen, Milo L....Little Falls
Hartjen, Jason K....Bemidji
Heid, James K....Little Falls
† Healy, Raymond T....Pierz
Hendricks, Esten J....Verndale
Hildebrand, John E....Bemidji
Hoganson, Donald E....Bemidji
§ Hughes, Bernard J....Brainerd
§ Johnson, Douglas L....Little Falls
† Johnson, Einar W....Bemidji
§ Kanne, Earl R....Brainerd
§ Kelley, Roger E....Crosby
§ Knoll, W. V....Brainerd
Larson, LeRoy J....Bagley
Lee, Hubert W....Brainerd
Longfellow, Helen W....Brainerd
Lund, Werner J....Staples
Lundsten, Leslie C....Bemidji
§ McLane, William O....Brainerd
§ Marshall, Clark M....Crosby
§ Marvin, Joseph E....Brainerd
§ Meller, Maurice....Brainerd
Mortenson, Howard O....Menahga
Mosby, Maurice E....Long Prairie
§ Mulligan, Arthur M....Brainerd
Murtaugh, Robert J....Wadena
Nichols, Raymond D....Crosby
§ Nixon, James B....Crosby
Nord, J. Erling....Staples
Nordlund, Mildred E....Cass Lake
§ O'Leary, John B....Brainerd
Olson, Lillian A....Ah-Gwah-Ching
Palmer, Harry A....Black Duck
Parker, Charles W....Wadena
Parker, Warren E....Sebeka
§ Pedersen, Robert L....Brainerd
§ Pelzl, Charles R....Pine River
Petraborg, Harvey T....Aitkin
Pettersen, George R....Aitkin
Pierce, Charles H....Wadena
§ Reichelderfer, Charles F....Staples
Quanstrom, Virgil E....Brainerd
Reichelt, Leland G....Wadena
§ Ringle, Otto F....Walker
† Sanderson, Anton G....Ashby
§ Stein, Raymond J....Pierz
§ Stoy, Robert A....Little Falls
Spurbeck, George H....Bemidji
Ulrich, Emery E....Crosby
§ Watson, Alexander M....Royalton
† Watson, Percy T....Miami, Fla.
Watson, Sidney W....Royalton
§ Westley, Kent....Little Falls
Whittemore, Dexter D....Bemidji
Will, William W....Bertha
§ Williams, Mervyn M....Ah-Gwah-Ching
Witter, Robert L....Wadena

WABASHA COUNTY MEDICAL SOCIETY

Wabasha County
Regular meeting, Special Call
Annual meeting, first Thursday after first Monday in October
Number of Members—15

President
FLATT, JOHN R....Wabasha
Secretary
MAHLE, DONALD G....Plainview

§ Bayley, E. Covell....Lake City
§ Bouquet, Bertram J....Wabasha
§ Bowers, Robert N....Lake City
† Collins, Joseph S....Wabasha
§ Ekstrand, LeRoy M....Wabasha
§ Ellis, Earl Wm....Elgin
§ Flatt, John R....Wabasha
§ Gjerde, William P....Lake City
Glabe, Robert A....Plainview
Habein, Harold C....Wabasha
§ Mahle, Donald G....Plainview
Martin, Doreen A....Pepin, Wis.
§ Ochsner, Clarence G....Wabasha
† Replogle, William H....Los Angeles, Calif.
§ Sontag, David W....Lake City

WASECA COUNTY MEDICAL SOCIETY

Waseca County

Regular meetings, January
Annual meeting, January
Number of Members—10

President
OELJEN, S. C. G.....Waseca
Secretary
DAVIS, RAYMOND D.....Waseca
§ Campbell, Wayne L.....Waseca
§ Davis, Raymond D.....Waseca
† Florine, Martin C.....Balboa Heights, Canal Zone
†§Gallagher, Bernard J.....Waseca
§ Hottinger, Raymond C.....Janesville
§ Normann, Stephen T., Jr.....Waseca
§ Oeljen, Siegfried C. G.....Waseca
§ Olds, George H.....New Richmond
§ Rohrer, Thomas P.....Waseca
§ Swenson, Orvie J.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Washington and Dakota Counties

Regular meetings, second Tuesday in each month except June, July, and August
Annual meeting, December
Number of Members—23

President
SHERMAN, C. H.....Bayport
Secretary
JOHNSON, ROBERT H.....Bayport
Brabec, Paul F.....Hastings
§ Carlson, Russel E.....Stillwater
Chappell, Elliott R.....Stillwater
§ Cottor, Robert E.....Stillwater
Fasbender, Herman T.....Hastings
†§Holcomb, Joel T.....Marine-on-St. Croix
§ Jenson, James E.....Stillwater
Johnson, Robert H.....Bayport
Johnson, O. Guy.....Bayport
Josewski, Raymond J.....Stillwater
§ Juergens, Manley F.....Stillwater
Just, Herman J.....Hastings
§ Kiolbasa, Edward B.....Stillwater
Kulzer, Norbert J.....Hastings
§ McCarten, Francis M.....Stillwater
† Mensheha, Nicholas.....Minneapolis
† Poirier, Joseph A.....Forest Lake
Ruggles, George M.....Forest Lake
§ Sherman, Carnot H.....Bayport
†§Stuhr, John W.....Stillwater
Torghele, John R.....Hastings
Van Meier, Henry.....Stillwater
Weiss, Carl A.....Hastings

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties

Regular meetings, 1st Tuesday in March, May, September and November
Annual meeting in November
Number of Members—26

President
BUCHER, FOSTER D.....Starbuck
Secretary
ZEMPEL, ALAN R.....Starbuck
§ Arneson, Arthur I.....Morris
§ Behmler, Frederick Wm.....Morris
†§Bergan, Otto.....Clinton
† Bolsta, Charles.....Ortonville
§ Bucher, Foster D.....Starbuck
†§Eberlin, Edward A.....Glenwood
§ Eide, O. A.....Hancock
*†Elsey, James R.....Glenwood
§ Hedemark, Homer H.....Ortonville
Hedemark, Truman A.....Ortonville
§ Karn, Jacob F.....Ortonville
§ Kolp, Berton A.....Glenwood
§ Kooda, Jennings C.....Morris
Lee, Gordon E.....Glenwood
§ Letson, Robert D.....Glenwood
§ Lindberg, Alfred L.....Wheaton
§ Magnuson, Allen E.....Wheaton
§ Merrill, Robert W.....Morris
Oliver, Irwin L.....Graceville
*†Ranson, Matthias L.....Hancock
§ Rossberg, Raymond A.....Morris
§ Swedenburg, Paul A.....Glenwood
Swendseen, Carl J.....Graceville
§ Watson, Robert M.....Morris
§ Winge, H. C.....Wheaton
§ Zempel, Alan R.....Starbuck

WINONA COUNTY MEDICAL SOCIETY

Winona County

Regular meetings, first Monday in January, April, July and October
Annual meeting, first Monday in January
Number of Members—32

President
WILSON, L. J.....Winona
Secretary
JOHNSTON, LEONARD F.....Winona
§ Bordman, Dalmon V.....Winona
§ Christensen, Eli E.....Winona
Degallier, Daniel.....Winona
§ Finkelnburg, William O.....Winona
§ Haesley, Warren W.....Winona
§ Hartwich, Roger F.....Winona
§ Hawk, Dale J.....St. Charles
§ Heise, Carl vR.....Winona
§ Heise, Herbert vR.....Winona
§ Heise, Paul vR.....Winona
§ Heise, Philip vR.....Winona
§ Heise, William.....Winona
§ Hughes, Sidney O.....Winona
§ Johnson, Curtis M.....Winona
§ Johnston, Leonard F.....Winona
§ Keyes, John D.....Winona
§ Loomis, George L.....Winona
§ McHutchinson, Samuel.....St. Charles
†§McLaughlin, Edmund M.....Winona
§ Mattison, Percy A.....Winona
§ Meinert, Albert E.....Winona
§ Roemer, Henry J.....Winona
§ Rogers, Charles W.....Winona
§ Satterlee, Howard W.....Lewiston
§ Schmidt, Hilmar R.....Rushford
§ Testor, James V.....Winona
§ Tweedy, John A.....Winona
§ Tweedy, Robert B.....Winona
§ Vollmer, Frederick J.....Winona
§ Wilson, Louis J.....Winona
§ Wilson, Rolland H.....Winona
§ Younger, Lewis I.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Wright County

Regular meetings, 1st Tuesday of every second month
Annual meeting, in November
Number of Members—15

President
SMORSTOK, M. B.....Monticello
Secretary
CATLIN, THEODORE J.....Buffalo
§ Anderson, Waldo P.....Buffalo
§ Bendix, Lester H.....Annandale
† Catlin, John J.....Buffalo
§ Catlin, Theodore J.....Buffalo
§ Ellison, Frank E.....Monticello
§ Greenfield, William T.....Cokato
§ Guilfoile, Pierre J.....Delano
§ Hall, William E.....St. Paul
§ Hart, William E.....Monticello
§ Purves, G. Harland.....Buffalo
§ Sandeen, Robert M.....Buffalo
Shin, Rok W.....Howard Lake
§ Smorstok, Matthew B.....Monticello
§ Thielen, Robert D.....Saint Michael
Thomas, William H.....Lindstrom

ZUMBRO VALLEY MEDICAL SOCIETY

Olmsted, Houston, Fillmore and Dodge Counties
Regular meetings, 1st Wednesday of odd numbered months
Annual meeting, 1st Wednesday in November
Number of Members—630

President
WELLMAN, W. E. ..... Rochester
Secretary
JOHNSON, E. W. ..... Rochester
Executive Secretary
FRICKE, ROBERT E. ..... Rochester

§ Aaro, Leonard A. ..... Rochester
§ Achor, Richard W. P. ..... Rochester
§ Adson, Martin A. ..... Rochester
§ Affeldt, Daniel E. ..... Kasson
§ Ahlfs, Jacob J. ..... Caledonia
Allaman, Loren E. ..... Rochester
§ Allen, Edgar V. N. ..... Rochester
† Amberg, Samuel ..... Rochester
† Amundsen, Melvin ..... Rochester
§ Andersen, Howard A. ..... Rochester
§ Anderson, Mark J. ..... Rochester
§ Anderson, Markham J., Jr. ..... Rochester
§ Anderson, Milton W. ..... Rochester
Angelos, S. Peter ..... Rochester
‡ Anzel, Sanford H. ..... Rochester

Baars, Conrad W. ..... Rochester
§ Baggenstoss, Archie H. ..... Rochester
§ Bahn, Robert C. ..... Rochester
§ Bair, Hugo L. ..... Rochester
¶ Bajec, Dusan ..... Belgrade, Yugoslovia
§ Baker, George S. ..... Rochester
† Baker, Harry R. ..... Hayfield
§ Baker, Hillier L., Jr. ..... Rochester
†§ Balfour, Donald C. ..... Rochester
Balfour, William M. ..... Lawrence, Kansas
† Banitt, Louis W. ..... Rochester
§ Banner, Edward A. ..... Rochester
§ Bargen, J. Arnold ..... Temple, Texas
§† Barker, Nelson W. ..... Rochester
†§ Barnes, Arlie R. ..... Rochester
§ Barry, Maurice J., Jr. ..... Rochester
§ Bartholomew, Lloyd G. ..... Rochester
§ Bastron, James A. ..... Rochester
§ Bayrd, Edwin D. ..... Rochester
§ Beahrs, Oliver H. ..... Rochester
Beargie, Richard J. ..... Rochester
† Beck, Richard L. ..... Rochester
† Becker, Kenneth L. ..... Rochester
† Beetham, William P., Jr. ..... Rochester
§ Belau, Paul G. ..... Rochester
† Benedict, William L. ..... Rochester
§ Berge, Kenneth G. ..... Rochester
§ Berge, S. Matthew ..... Rochester
† Beringer, E. Duane ..... Rochester
† Berke, Joseph J. ..... Rochester
Berkman, David S. ..... Rochester
§ Berkman, John M. ..... Rochester
Berman, Irwin B. ..... Rochester
Berman, Stanley ..... Rochester
§ Bernatz, Philip E. ..... Rochester
§ Bianco, Anthony J., Jr. ..... Rochester
§ Bickel, William H. ..... Rochester
† Bigelow, Charles E. ..... Dodge Center
Bigg, Richard L. ..... Rochester
† Biggs, Alfred D., Jr. ..... Rochester
† Birdsall, Charles J. ..... Rochester
§ Black, B. Marden ..... Rochester
§ Blackburn, Charles M. ..... Rochester
Bledsoe, Francis H. ..... Rochester
Boolukos, George P. N. ..... Rochester
Bowen, Ralph, Jr. ..... Rochester
† Bowen, Stephen F., Jr. ..... Rochester
§ Boyd, David A., Jr. ..... Rochester
† Braasch, William F. ..... Rochester
§ Brandenburg, Robert O. ..... Rochester
§ Brannick, Thomas L. ..... Rochester
Breslin, Donald J. ..... Rochester
§ Broadbent, James C. ..... Rochester
§ Brodhun, John C. ..... Rochester
† Brookler, Morton I. ..... Rochester
§ Brown, Alexander E. ..... Rochester
Brown, Arnold L. ..... Rochester
† Brown, David N. ..... Rochester
§ Brown, Henry A. ..... Rochester
§ Brown, Joe R. ..... Rochester
§ Brown, Philip W. ..... Rochester
Brown, Philip W., Jr. ..... Rochester
† Brown, Robert C. ..... Rochester
§ Brunsting, Louis A. ..... Rochester
† Buie, Louis A. ..... Rochester
Buie, Louis A., Jr. ..... Rochester
† Burbank, Mahlon K. ..... Rochester
§ Burchell, Howard B. ..... Rochester
§ Burgert, E. O., Jr. ..... Rochester
§ Burich, Harry F. ..... Rochester
† Burk, Emmett K. ..... Rochester
§ Burke, Edmund C. ..... Rochester
† Burnes, Edward A., Jr. ..... Rochester
§ Butt, Hugh R. ..... Rochester
Bynum, Grover L., Jr. ..... Rochester
Byrd, Richard B. ..... Rochester
Cadman, Norman L. ..... Rochester
§ Cain, James C. ..... Rochester
† Caldarola, Vincent T. ..... Rochester
§ Callahan, John A. ..... Rochester
‡ Calverley, John R. ..... Rochester
† Camp, John D., Jr. ..... Rochester
§ Campbell, Donald C. ..... Rochester
§ Campbell, Malcolm K. ..... Rochester
Carnevali, John F. ..... Rochester
† Carpenter, William B. ..... Rochester
Carr, David T. ..... Rochester
§ Carryer, Haddon McC. ..... Rochester
Carveth, Stephen W. ..... Rochester
Casdorph, Herman R. ..... Rochester
† Casey, Thomas H. ..... Rochester
§ Childs, Donald S., Jr. ..... Rochester
§ Christensen, Norman A. ..... Rochester
§ Clagett, O. Theron ..... Rochester
§ Clark, Edward C. ..... Rochester
Clark, Lealand L. ..... Rochester
Clark, Leslie W. ..... Spring Valley
† Clifton, Theodore A. ..... Hollywood, Fla.
‡ Clowdus, Bernard F. ..... Bolling Air Force Base 25, D. C.
† Cody, D. Thane ..... Rochester
Coffey, William F. X. ..... Rochester
† Cohen, Donald M. ..... Rochester
Cohen, Ellen K. ..... Rochester
Cohen, Hyman L. ..... Rochester
§ Colby, Malcolm Y., Jr. ..... Rochester
§ Connolly, Daniel C. ..... Rochester
Connor, P. James ..... Rochester
§ Cook, Edward N. ..... Rochester
§ Cooper, Talbert ..... Rochester
§ Corbin, Kendall B. ..... Rochester
‡ Corr, William P. ..... Rochester
§ Corrigan, Cyril J. ..... Rochester
‡ Cottone, Francis J. ..... Trenton, N. J.
Coughlin Dennis, Jr. ..... Rochester
§ Coventry, Markham B. ..... Rochester
*† Craig, Winchell McK. ..... Rochester
Crandall, Earle E. ..... Rochester
§ Culp, Ormond S. ..... Rochester
† D'Agostino, Anthony ..... Rochester
Dahlin, David C. ..... Rochester
§ Daly, David D. ..... Rochester
† Damron, John C. ..... Rochester
§ Daugherty, Guy W. ..... Rochester
Davidson, Paul ..... Rochester
† Davis, Austin C. ..... Florida
§ Davis, George D. ..... Rochester
§ Dearing, William H. ..... Rochester
§ Decker, David G. ..... Rochester
† Degnan, Thomas J. ..... Rochester
De la Vega, Daniel J. ..... Rochester
§ Devine, Kenneth D. ..... Rochester
§ DeWeerd, James H. ..... Rochester
§ Deissner, Grant R. ..... Rochester
† Dickson, Harrison M. ..... Rochester
§ Divertie, Matthew ..... Rochester
Dixon, Claude F. ..... Rochester
† Dobbs, Joseph J. ..... Rochester
§ Dockerty, Malcolm B. ..... Rochester
Dombrowski, Edmond T. ..... Rochester
§ Donoghue, Francis E. ..... Rochester
§ Douglass, Bruce E. ..... Rochester
§ Doyle, James R. ..... Rochester
† Drips, Della G. ..... Oronoco
Dry, Thomas J. ..... Capetown, Africa
† Dumont, Guy ..... Rochester
§ DuShane, James W. ..... Rochester
§ Dyer, John Allen ..... Rochester
§ Edwards, Jesse E. ..... Rochester
§ Elkins, Earl C. ..... Rochester
§ Ellis, F. Henry ..... Rochester
§ Emmett, John L. ..... Rochester
Engler, Robert S. ..... Rochester
§ Englund, Garth W. ..... Mabel
§ Erich, John B. ..... Rochester
§ Erickson, Donald J. ..... Rochester
Estes, J. Earle, Jr. ..... Rochester
†§ Eusterman, George B. ..... Rochester
† Evarts, Arrah B. ..... Rochester
Evenson, David J. ..... Rochester
§ Faber, John E. ..... Rochester
Fairbairn, John F. ..... Rochester
† Farmer, John L., Jr. ..... Rochester
† Fatum, Paul J. ..... Rochester
*§ Faucett, Robert L. ..... Rochester
§ Faulconer, Albert, Jr. ..... Rochester
Faust, Herbert A. ..... Rochester
‡ Feinerman, Burton ..... Brooklyn, N. Y.
Feldmann, Floyd M. ..... Rochester
§ Ferris, Deward O. ..... Rochester
§ Ferguson, Richard H. ..... Rochester
†§ Figi, Frederick A. ..... Rochester
§ Fluegal, John O. ..... Rochester
† Fons, Anthony L, III ..... Rochester
Foss, Edward L. ..... Rochester
§ Foulk, William T., Jr. ..... Rochester
† Fox, Nelson M., Jr. ..... Rochester
† Francis, Robert L. ..... Rochester
Franckowiak, John J. ..... Rochester
§ Frethem, Allen A. ..... Rochester
§ Fricke, Robert E. ..... Rochester
Friesen, Gerhard ..... Rochester
Frischknecht, Albert ..... Rochester
† Galbraith, Richard F. ..... Rochester
†§ Gambill, Carl M. ..... Rochester
§ Gambill, Earl E. ..... Rochester
Gannon, Paul G. ..... Rochester
§ Gastineau, Clifford F. ..... Rochester
Gatzke, Laurence D. ..... Rochester
† Gedge, Stafford W. ..... Rochester
Gerber, Edward ..... Rochester
§† Geraci, Joseph E. ..... Rochester
† Giffin, Herbert Z. ..... Rochester
§ Gifford, R. W., Jr. ..... Rochester
Giles, William F. ..... Rochester
† Gill, Charles Richard ..... Rochester
Gilloon, James R. ..... Rochester
Glick, Dallas D. ..... Rochester
† Goethals, Paul L. ..... Rochester
§ Goldstein, Norman P. ..... Rochester
§ Good, C. Allen, Jr. ..... Rochester
† Gordon, Alan L. ..... Rochester
§† Gould, Allan B., Jr. ..... Rochester
† Granberry, Warren M. ..... Rochester
Graudins, Gunars ..... Rochester
† Gregg, James A. ..... Rochester
† Green, Paul A. ..... Rochester
§ Greene, Laurence F. ..... Rochester
Grindlay, John H. ..... Rochester
§ Gross, John B. ..... Rochester
† Gutman, Arnold A. ..... Rochester
§ Hagedorn, Albert B. ..... Rochester
§† Haines, Samuel F. ..... Rochester
† Hallberg, Olav Erik ..... Rochester
† Hallenbeck, Dorr F. ..... Rochester
† Hallenbeck, George A. ..... Rochester
§ Hanlon, David G. ..... Rochester
§ Hanson, Norbert Orrin ..... Rochester
§ Hargraves, Malcolm ..... Rochester
† Harrington, Stuart W. ..... Rochester
§ Harris, Lloyd E. ..... Rochester
§ Harrison, Edgar G., Jr. ..... Rochester
*†§ Hartman, Howard R. ..... Rochester
Hartridge, Virginia B. ..... Rochester
† Hartzell, John M. ..... Rochester
Hauser, Harris M. ..... Rochester
† Havens, Fred Z. ..... Riverside, Calif.
§ Hayles, Alvin B. ..... Rochester
§ Heck, Frank J. ..... Rochester
Heilman, Fordyce R. ..... Rochester
† Helm, Walter J. ..... Rochester
§ Henderson, Edward D. ..... Rochester
§ Henderson, John W. ..... Rochester
§ Henderson, Lowell L. ..... Rochester
§ Hepper, Norman G. ..... Rochester
† Hewitt, Edith S. ..... Rochester
† Hewitt, Richard M. ..... Rochester
§ Higgins, John A. ..... Rochester
§ Hill, John Roger ..... Rochester
§ Hill, Richard Woolsey ..... Rochester
Hines, Edgar A., Jr. ..... Rochester
† Hitselberger, William E. ..... Rochester
§ Hodgson, Corrin H. ..... Rochester
§ Hodgson, John R. ..... Rochester
Hoffman, David L. ..... Rochester
† Holbrook, Margaret ..... Rochester
§ Holland, C. R. ..... Rochester
§ Hollenhorst, Robert W. ..... Rochester
† Holley, Keith E. ..... Rochester
§ Holman, Colin B. ..... Rochester
† Holsinger, Donald R. ..... Rochester
† Honet, Joseph C. ..... Rochester
Hoover, Norma W. ..... Rochester
Hopkins, Donald M. ..... Rochester
† Hopkins, James W. ..... Rochester
†§ Horton, Bayard T. ..... Rochester
Howard, Eric G. ..... Spring Valley
§ Howard, Frank M., Jr. ..... Rochester
§ Howell, Llewelyn P. ..... Rochester
‡ Huff, James F. ..... Alexandria
§ Huizenga, Kenneth A. ..... Rochester
§ Hunt, Arthur B. ..... Rochester
§ Hunt, James Calvin ..... Rochester

Hunt, James Cleon,.....Rochester
§ Hunter, James S., Jr.....Rochester

† Iliescu, John, Jr.....Rochester
‡ Inlow, Robert P.....Rochester
Ivers, Robert R.....Rochester
§§§ Ivins, John C.....Rochester
§§§ Ivy, Horace K.....Rochester

§ Jackman, Raymond J.....Rochester
Jaffe, Manuel O.....Rochester
§§§ Janes, Joseph M.....Rochester
§§§§§ Johnson, Carl E.....Rochester
§§§§§ Johnson, Einer W., Jr.....Rochester
† Johnson, Leonard M.....Rochester
Johnson, Ralph Allen.....Rochester
Johnson, Ralph B.....Lanesboro
Johnson, Victor.....Rochester
Joyce, George L.....Rochester
† Joyce, John W.....Rochester
† §§§ Judd, Edward S.....Rochester
§§§ Juergens, John L.....Rochester

‡ Kaye, Ronald L.....Unknown
§§§§ Kearns, Thomas P.....Rochester
§§§§ Keating, Francis R., Jr.....Rochester
† Keck, Stanley W.....Rochester
Keefe, William P.....Rochester
§§ Keith, Haddow M.....Rochester
§† Keith, Norman M.....Rochester
† Kelly, Patrick J.....Rochester
§§§§§§§§§ Kennedy, Roger L. J.....Rochester
§§§§§§§§§ Kernohan, James W.....Rochester
§§§§§§§§§ Kiely, Joseph M.....Rochester
§§§§§§§§§ Kierland, Robert R.....Rochester
§† Kim, Robert.....Rochester
§ Kincaid, Owings W.....Rochester
Kinzel, Raymond C.....Rochester
§§§§ Kirby, Thomas J., Jr.....Rochester
§§§§ Kirklin, John W.....Rochester
‡§§§§§ Kirshen, Robert.....Rochester
§§§§§§§§§ Klass, Donald W.....Rochester
§§§§§§§§§ Knutson, Lewis A.....Spring Grove
§§§§§§§§§ Koelsche, Giles A.....Rochester
† Kohn, Eleanor M.....Rochester
† Krabill, Donald R.....Rochester
Kretschmar, Paul O.....Rochester
§§§§ Krusen, Frank H.....Rochester
§§§ Kvale, Walter F.....Rochester
Kyle, Robert A.....Rochester

§§ Lake, Clifford F.....Rochester
‡§ Lansche, Richard K.....Rochester
Larson, Norman E.....Rochester
† Larson, Richard E.....Rochester
† Lauvstad, Walter A.....Rochester
§ Lazarte, Jorge A.....Rochester
† Lee, John W.....Rochester
† Lee, Ling Hong.....Rochester
§§ Lee, Robert E.....Rochester
† Lehrman, Arthur.....Rochester
† Leigh, John E.....Rochester
† Levis, Michael P.....Rochester
† Lidsky, Martin D.....Rochester
† Liebesman, William P.....Rochester
§§§ Lillie, John C.....Rochester
§§§ Lipscomb, Paul R.....Rochester
Lipson, Richard L.....Rochester
§§§§§§§§§ Litin, Edward M.....Rochester
§§§§§§§§§ Litzow, Thaddeus J.....Rochester
§§§§§§§§§ Lofgren, Karl A.....Rochester
§§§§§§§§§ Logan, George B.....Rochester
Lorenc, Ernest.....Rochester
§§§ Love, J. Grafton.....Rochester
† Lyne, Benjamin W.....Rochester

† McCormick, Patrick J.....Rochester
§§§§§ MacCarty, Collin S.....Rochester
§§§§§ MacCarty, William C.....Rochester
MacLean, Alexander R.....Rochester
§ Magath, Thomas B.....Rochester
Magee, Charles J.....Rochester
† Magid, Gail A.....Rochester
§§§§§ Maher, Frank T.....Rochester
‡§§§§ Malkasian, George D., Jr...N. Chicago, Ill.
§§§§§ Mankin, Harold T.....Rochester
Marshall, Hiram W.....Rochester
§§§§§ Martens, Theodore G.....Rochester
§§§§§ Martin, Gordon M.....Rochester
§§§§§ Martin, John H.....Rochester
§§§§§ Martin, John T.....Rochester
Martin, Maurice J.....Rochester
§§§§§ Martin, William J.....Rochester
§§§§§ Masson, Duncan M.....Rochester
§§§§§ Masson, James C.....Rochester
§§§§§ Masson, James K.....Rochester
Mathieson, Don R.....Rochester
Mayberry, William E.....Boston, Mass.
Mayne, John G.....Rochester
§ Mayo, Charles W.....Rochester
Maytum, W. James.....Rochester
§§§§§ McBean, James B.....Rochester
§§§§§ McConahey, William M., Jr.....Rochester
McDonald, Colin C.....Rochester
§§§§§ McGoon, Dwight C.....Rochester
† McHenry, Martin.....Rochester
McIlhany, Mary Lou....Albuquerque, N. M.

* McKaig, Carle B.....Pine Island
† McKillop, Robert G.....Rochester
§§§§§ Merritt, Wallace A.....Rochester
† Metge, William R.....Rochester
† Meyerding, Henry W.....Rochester
Meyers, Vernon William.....Rochester
† Michener, William M.....Rochester
† Mielke, John E.....Rochester
Miller, Archie W.....Rochester
§§§§§ Miller, Roland D.....Rochester
§§§§§ Miller, Ross H.....Rochester
§§§§§ Millikan, Clark H.....Rochester
§§§§§ Mills, Stephen D.....Rochester
Mitchell, William C.....Rochester
† Moersch, Frederick P...Ft. Lauderdale, Fla.
§§§§§ Moersch, Herman J.....Rochester
§§§§§ Moertel, Charles G.....Rochester
§§§§§ Molnar, George D.....Rochester
† Monge, James J.....Rochester
†§§§§§ Montgomery, Hamilton.....Rochester
Mori, Hideo.....Rochester
§§§§§ Morlock, Carl G.....Rochester
§§§§§ Morrow, George W., Jr.....Rochester
Moskowitz, Roland W.....Rochester
§ Mulder, Donald W.....Rochester
† Mullady, Thomas F., III.....Rochester
Murphy, Frank P.....Rochester
Mussey, Mary E.....Rochester
§ Myers, Thomas T.....Rochester

† Neault, Roger W.....Rochester
Nehring, Jesse P.....Preston
Nelson, George E.....Rochester
† Nelson, James W.....Rochester
† Nelson, Jerald C.....Rochester
§ Nichols, Donald R.....Rochester
† Nirschl, Robert P.....Rochester
‡ Nolan, Robert B.....Rochester
Norris, Neil T.....Caledonia
Norstrom, Craig W.....Rochester

† Odel, Howard M.....Rochester
Okihiro, Michael M.....Rochester
§ Olsen, Arthur M.....Rochester
§ Olson, Ernest A.....Pine Island
Olson, Grant E.....West Concord
Onsgard, L. Kenneth.....Houston
§ Osmundson, Philip J.....Rochester
Overton, Dolphin H., Jr.....Rochester
§ Owen, Charles A., Jr.....Rochester
Ownbey, Richard P.....Rochester

‡ Packard, Dean W.....Rochester
Papp, Andrew.....Rochester
§ Paris, Jaime.....Rochester
§ Parker, Robert L.....Rochester
Parkhill, Edith M.....Rochester
§ Parkin, Thomas W.....Rochester
Parr, Eugene Q.....Rochester
§ Pascuzzi, Chris A.....Rochester
§§§§§ Patrick, Robert T.....Rochester
† Patterson, Richard J.....Rochester
§ Paulson, John A.....Rochester
Payne, William S.....Rochester
Pease, Gertrude L.....Rochester
§§† Pemberton, John de J.....Rochester
§§§§§ Perry, Harold O.....Rochester
§§§§§ † Perry, Richard E.....Rochester
§§§§§ Peters, Gustavus A.....Rochester
§§§§§ Petersen, Magnus C.....Rochester
§§§§§ Peterson, Lowell F. A.....Rochester
† Piper, Monte C.....Lacanada, Calif.
§ Plum, George E.....Rochester
§§§§§ Polley, Howard F.....Rochester
§ Pool, Thomas L.....Rochester
Posey, John W.....Rochester
§ Pratt, Joseph Hyde, Jr.....Rochester
§§§§§ Prickman, Louis E.....Rochester
§§§§§ Priestley, James T.....Rochester
§§§§§ Pugh, David G.....Rochester
† Pulec, Jack L.....Rochester
§ Purnell, Don C.....Rochester

§ Ralston, Donald E.....Rochester
Ramsdell, John Alan.....Rochester
§§§§§ Randall, Lawrence M.....Rochester
§§§§§ Randall, Raymond V.....Rochester
§§§§§ Reitemeier, Richard J.....Rochester
§§§§§ ReMine, William H., Jr.....Rochester
§§§§§ Restall, Charles J.....Rochester
Reuland, John J.....Rochester
‡ Reynolds, William A.....New York, N. Y.
Rhoads, Donald V.....Rochester
§ Risser, Alden F.....Stewartville
† Rivers, Morris H.....Rochester
Roberts, Frank E.....Reno, Nevada
Rodling, Herbert.....Rochester
§ Rogne, William G.....Spring Grove
§§§§§ Rome, Howard P.....Rochester
§§§§§ Rooke, Edward D.....Rochester
Ross, Griff T.....Rochester
Ross, James V.....Rochester
Ross, Margaret.....Rochester
Roth, Harry Leo.....Rochester
§ Rovelstad, Randolph A.....Rochester
† Rowland, Spencer A.....Rochester
§ Rucker, Charles W.....Rochester

† Ruffolo, Eugene H.....Rochester
† Rulon, John T.....Rochester
Rushing, Lige B., Jr.....New Orleans, La.
§ Rushton, Joseph G.....Rochester
§§§§§ Rynearson, Edward H.....Rochester

† Salamone, Charles R.....Rochester
§§§§§ Salassa, Robert M.....Rochester
† Sanderson, David R.....Rochester
Sasano, Joseph R., Jr.....Rochester
§ Sauer, William G.....Rochester
Sayre, George P.....Rochester
§ Scanlon, Paul W.....Rochester
Schaefer, Joseph C.....Rochester
§ Scheifley, Charles H.....Rochester
Schirger, Alexander.....Rochester
Schmidt, Charles D.....Rochester
§§§§§ Schmidt, Herbert W.....Rochester
§§§§§ Scholz, Donald A.....Rochester
‡§§§§§ Schwartz, John T.....Norfolk, Va.
‡§§§§§ Scott-Miller, James R.....Phoenixville, Pa.
§§§§§ Scudamore, Harold H.....Rochester
Seay, James Elbert.....Minneapolis
‡ Sebrechts, Paul.....Great Lakes, Ill.
§§§§§ Sedlack, Richard E.....Rochester
§§§§§ Seldon, Thomas H.....Rochester
Semler, Herbert J.....Rochester
† Shamblin, James R., Jr.....Rochester
‡ Sherrick, Donald W.....
Fort Leonard Wood, Mo.
§ Shick, Richard M.....Rochester
† Sibley, William L., III.....Rochester
§ Siekert, Robert G.....Rochester
Silverman, Lloyd.....Rochester
Silverstein, Murray N.....Rochester
Silvis, Stephen E.....Spring Valley
† Simons, John N.....Rochester
§ Simonton, Kinsey M.....Rochester
Skaug, Harold M.....Chatfield
§ Slocumb, Charles H.....Rochester
†§§§§§ Smith, Frederick L.....Rochester
† Smith, Harry L.....Rochester
† Smith, John H.....Augusta, Ga.
§§§§§ Smith, Lucian A.....Rochester
§§§§§ Smith, Ralph E.....Rochester
§§§§§ Smith, Reginald A.....Rochester
Sones, Donald A.....Rochester
† Sorenson, James M.....Rochester
† Souders, John C.....Rochester
§§§§§ Soule, Edward H.....Rochester
§§§§§ Spencer, Robert J.....Rochester
Spikerman, Ralph Earl.....Rochester
§§§§§ Spittel, John A., Jr.....Rochester
§§§§§ Sprague, Randall G.....Rochester
Spurgeon, Frederick C.....Rochester
† Stanley, Kenneth E., Jr.....Rochester
§§§§§ Stauffer, Maurice H.....Rochester
§§§§§ Steinhilber, Richard M.....Rochester
Steinhour, Jerold F.....Rochester
§§§§§ Stickney, J. Minott.....Rochester
§§§§§ Stillwell, George K.....Rochester
§§§§§ Stilwell, George G.....Rochester
Stoltze, Cynthia A.....Rochester
Stool, Newsom.....Rochester
† Striebel, James L.....Rochester
§§§§§ Stroebel, Charles F., Jr.....Rochester
§§§§§ Sullivan, Charles R.....Rochester
§§§§§ Svien, Hendrik J.....Rochester
† Swedlund, Harry A.....Rochester
§§§§§ Symmonds, Richards E.....Rochester

Tama, Lawrence.....Rochester
Taswell, Howard F.....Rochester
§ Tauxe, Welby N.....Rochester
Taylor, Lawrence.....Rochester
Teynor, Joseph W.....Rochester
Thomas, Juergens E.....Rochester
§ Thompson, Gershom J.....Rochester
Thompson, John W., III.....Rochester
Thurber, Deloron.....Rochester
§ Tillisch, Jan H.....Rochester
Titus, Jack L.....Rochester
† Treacy, William.....Rochester
Trelle, H. Dieter.....Rochester
† Tuffanelli, Denny L.....Rochester
† Tutton, Roger H.....Rochester

§ Uihlein, Alfred.....Rochester
§ Underdahl, Laurentius O.....Rochester
Urban, F. Henry.....Rochester
§ Utz, David C.....Rochester
Utz, Philip H.....La Crescent

§ Van Herik, Martin.....Rochester
§§§§§ Vaughn, Louis D.....Rochester
§§§§§ Verby, John E., Jr.....Rochester
Virnig, Hildegard, J.....Caledonia
† Vogel, Melvin D.....Rochester
† Von Heimburg, Roger L.....Rochester

† Wagener, Henry P.....Rochester
Wagoner, James M.....Harmony
Wakefield, Elmer G.....Springfield, Mo.
§†§§§§ Wakim, Khalil G.....Rochester
† Walters, Edward W.....Rochester
§§§§§ Walters, Waltman.....Rochester
§§§§§ Ward, Louis E.....Rochester

§ Watkins, Charles H.....Rochester
Watson, John R.....Medford, Ore.
§ Waugh, John M.....Rochester
Weaver, Walt F.....Rochester
† Weber, John C.....Rochester
§ Weed, Lyle A.....Rochester
§ Weeks, Richard E.....Rochester
§ Weidman, William H.....Rochester
† Weinstein, Eugene C.....Rochester
†§ Weir, James F.....Rochester
Weisz, Samuel.....Rochester
§ Welch, John S.....Rochester
§ Wellman, William E.....Rochester
Wellner, Theodore O.....Rochester
§ Wente, Harold A.....Rochester
† West, J. Robert.....Rochester
Westrup, John E.....Lanesboro
§ Weyhrauch, William R.....Rochester
§ Whisnant, Jack P.....Rochester
† Whitaker, John J.....Rochester
Whitcomb, Fred F., Jr.....Rochester
White, James C.....Rochester
White, Robert J.....Rochester
Whitman, Edwin J.....Rochester
Wiener, Jerry M.....Rochester
‡ Wilbur, Dwight Locke, III.....Rochester
*† Wilder, Russell M.....Rochester
§ Williams, Henry L.....Rochester
Wilson, Paul F.....Rochester
§ Wilson, Robert B.....Rochester
§ Wilson, Viktor O.....Rochester
§ Winkelmann, Richard K.....Rochester
‡ Winter, Malcolm D., Jr.....
Ellsworth A.F.B., So. Dak.
Wise, James K.....Rochester
Witten, David M.....Rochester
§ Wollaeger, Eric E.....Rochester
† Woltman, Henry W.....Rochester
§ Wood, Lloyd T.....Rochester
Woodington, George F.....Rochester
§ Woolner, Lewis B.....Rochester
Worlton, James T.....Rochester
§ Worthington, John W., Jr.....Rochester
Wry, Paul E.....Rochester
† Yadusky, Donald P.....Rochester
§ Yoss, Robert E.....Rochester
§ Young, Henry H.....Rochester
† Zitnik, Ralph S.....Rochester

Alphabetic Roster

Key to Symbols:
†Life, Resident or Associate Members; ‡Military Service; *Deceased; ¶Honorary

† Aanes, Almer M. ....Red Wing
Aaro, Leonard A. ....Rochester
Abraham, Arden L. ....Duluth
Abrams, Alexander, Jr. ....St. Paul
Abramson, Milton ....Minneapolis
Abullarade, Jose A. ....Minneapolis
Achor, Richard W. P. ....Rochester
Adair, Albert F., Jr. ....St. Paul
† Adams, Bertram S. ....Hibbing
Adams, Harold R. ....St. Paul
Addy, Edward R. ....Gilbert
Adkins, Charles D. ....Minneapolis
Adkins, Galen H. ....Sandstone
Adkins, James T. ....Bertha
Adson, Martin A. ....Rochester
Affeldt, Daniel E. ....Kasson
Aga, John H. ....Brainerd
† Ager, Ernest A. ....Minneapolis
Agustsson, Hreidar ....Minneapolis
Ahern, Eugene E. ....Minneapolis
Ahern, Gene J. ....Red Wing
Ahlfs, Jacob J. ....Caledonia
Ahlstrom, Robert C. ....Braham
Ahola, Kenneth E. ....Hibbing
† Ahrens, Albert E. ....St. Paul
Ahrens, Curtis F. ....Duluth
Ahrens, Robert M. ....St. Paul
Akins, Willard M. ....Red Wing
Alari, Heino ....Minneapolis
Albrecht, H. H. ....Lindstrom
Alcorn, William J. ....Wabasso
Alden, John F., Jr. ....St. Paul
Alden, W. Charles ....Kimball
Alexander, Harlan A. ....Minneapolis
Aling, Charles A. ....Minneapolis
Allaman, Loren E. ....Rochester
Allen, Edgar V. N. ....Rochester
Allen, John H. ....Montevideo
Allison, David D. ....Litchfield
† Altnow, Hugo O. ....Coral Gables 34, Fla.
Alton, Donald G. ....St. Paul
Amatuzio, Donald S. ....Minneapolis
† Amberg, Samuel ....Rochester
Ambrus, Laszlo ....St. Paul
Amerongen, W. W. ....St. Paul
† Amundsen, Melvin A. ....Rochester
Anderegg, Alfred F. ....Minneapolis
Andersen, Howard A. ....Rochester
Anderson, Arden O. ....Brainerd
Anderson, Arnold S. ....St. Louis Park
Anderson, Chester A. ....Hector
Anderson, Chester A. ....Madison
Anderson, David M. ....St. Louis Park
Anderson, David P., Jr. ....Austin
† Anderson, Edward D. ....Gstaad, Switzerland
Anderson, Ernest R. ....Minneapolis
Anderson, Frank J. ....Minneapolis
Anderson, Franklin C. ....Owatonna
Anderson, Harold J. ....Austin
Anderson, James J. ....Mankato
Anderson, John A. ....Minneapolis
Anderson, John W. ....Blue Earth
Anderson, Karl W. ....Minneapolis
Anderson, Margaret C. ....St. Paul
Anderson, Mark J. ....Rochester
Anderson, Markham J., Jr. ....Rochester
Anderson, Milton W. ....Rochester
† Anderson, Richard E. ....Willmar
Anderson, Richard W. ....Minneapolis
Anderson, Richard W. ....Aurora
Anderson, Roger L. ....Minneapolis
Anderson, U. Schuyler ....Minneapolis
Anderson, Waldo P. ....Buffalo
Anderson, Wallace E. ....Clearbrook
Anderson, Wallace E. ....Minneapolis
Anderson, Wallace R. ....Austin
Anderson, Werner W. ....Brainerd
Anderson, William H. ....Minneapolis
Anderson, William T. ....Minneapolis
† Andreassen, Einar C. ....Minneapolis
Andreassen, Rolf L. ....Minneapolis
Andresen, Karl d'A. ....Minneapolis
Andrews, Robert S. ....Minneapolis
† Andrews, Roy N. ....Mankato
Angelos, S. Peter ....Rochester
Ankner, Frank J. ....Minneapolis
Anonsen, Richard E. ....Minneapolis
Antonow, Arthur M. ....Virginia
‡ Anzel, Sanford H. ....Shaw AFB, S. C.
† Arends, Archabald L. ....Minneapolis
Arey, S. Lane ....Minneapolis
Arhelger, Stuart W. ....Minneapolis
Arlander, Clarence E. ....Minneapolis
Arling, Leonard S. ....Minneapolis
Arms, James J. ....Minneapolis
Armstrong, Byron H. ....Hopkins
Armstrong, Ralph S. ....Winnebago
Arnesen, John F. ....Owatonna
Arnesen, Paul M. ....Minneapolis
Arneson, Arthur I. ....Morris
Arnold, Ann W. ....Minneapolis
* Arnold, Elmer W. ....Adrian
Arnquist, Andrew S. ....St. Paul
Arny, Frederick P. ....St. Paul
Arvidson, Carl G. ....Minneapolis
Arzt, Philip K. ....St. Paul
Asta, Joseph J. ....Duluth
† Athens, Alvin G. ....Duluth
Atmore, William G. ....Duluth
Aufderheide, Arthur C. ....Duluth
Aulick, Ernest J. ....Paynesville
Aurelius, J. Richards ....St. Paul
Ausman, Duane R. ....St. Paul
Austrian, Sol ....St. Paul
Autrey, William A. ....St. Cloud
Azad, A. M. ....Minneapolis

Baars, Conrad W. ....Rochester
Babb, Frank Shaleen ....St. Paul
Backer, Gordon L. ....Rochester
Backus, Byron C. ....Cloquet
Backus, Lloyd B. ....Cloquet
Backus, Reno W. ....Nopeming
Badeaux, George I. ....Brainerd
Bader, J. L. ....Slayton
* Baer, Walter ....St. Paul
Baggenstoss, Archie H. ....Rochester
Baggenstoss, Osmund J. ....Minneapolis
Bagley, Charles M. ....Duluth
Bagley, Elizabeth C. ....Duluth
Bagley, Russell W. ....Minneapolis
† Bagley, William R. ....Duluth
Bahn, Robert C. ....Rochester
Baich, Velemir M. ....Coleraine
Bair, Hugo L. ....Rochester
Baird, Joe W. ....Minneapolis
Baird, Raymond L. ....St. Paul
¶ Bajec, Dusan ....Belgrade, Yugoslavia
Baken, Melvin P. ....Minneapolis
Baken, Melvin P., Jr. ....Minneapolis
Baker, Abe B. ....Minneapolis
† Baker, Alfred T. ....Minneapolis
Baker, George S. ....Rochester
† Baker, Harry R. ....Hayfield
Baker, Hillier L., Jr. ....Rochester
Baker, Jeannette L. ....Fergus Falls
Baker, John H. ....New Ulm
Baker, Milton E. ....Minneapolis
Baker, Norman H. ....Fergus Falls
Bakke, Arnold C. ....Minneapolis
Bakkila, Henry E. ....Duluth
Balcome, Milton M. ....St. Paul
Baleisis, Peter ....Minneapolis
† Balfour, Donald C. ....Rochester
Balfour, William M. ....Lawrence, Kan.
Balkin, Samuel G. ....Minneapolis
Balmer, Albert I. ....Duluth
Balogh, Charles J. ....Minneapolis
† Banitt, Louis W. ....Rochester
Bank, Harry E. ....Minneapolis
Banner, Edward A. ....Rochester
Barber, Tracy E. ....Austin
Bardon, Richard ....Duluth
Bargen, J. Arnold ....Temple, Texas
Barker, John D. ....Duluth
† Barker, Nelson W. ....Rochester
† Barnes, Arlie R. ....Rochester
Barnes, Richard E. ....Aurora
Barnett, Joseph M. ....St. Paul
Barnett, Robert M. ....Minneapolis
† Barney, Leon A. ....Duluth
Barno, Alex ....St. Louis Park
Barr, James S. ....Elmore
Barr, Lowell C. ....Albert Lea
Barr, Maxwell M. ....Minneapolis
Barr, Robert N. ....Minneapolis
Barr, Ronald W. ....Montevideo
Barrett, Earl E. ....Duluth
Barron, Jesse J. ....Minneapolis
† Barron, Moses ....Minneapolis
Barron, S. Steven ....Minneapolis
Barry, George J. ....Chisholm
Barry, Maurice J., Jr. ....Rochester
† Barsness, Nellie O. N. ....St. Paul
Bartholomew, Lloyd G. ....Rochester
Bartness, John ....Albert Lea
Bartzen, Peter J. ....Duluth
Basinger, Harold P. ....Windom
Basinger, Homer P. ....Windom
Bastron, James A. ....Rochester
Bateman, Clarence V. ....Breckenridge
Batdorf, B. Niles ....Mankato
Bauer, Eugene L. ....St. Paul
Bauer, Paul G. ....Faribault
Baumgartner, Florian H. ....Albany
Bayley, E. Covell ....Lake City
Bayrd, Edwin D. ....Rochester
Beach, Northrop ....Minneapolis
Beahrs, Oliver H. ....Rochester
*† Beals, Hugh ....La Jolla, Calif.
Bean, Charles N. ....Waconia
Beargie, Richard J. ....Rochester
Beaton, J. Gordon ....Northfield
Beck, Charles J. ....North St. Paul
† Beck, Richard L. ....Rochester
† Becker, Arnetta M. ....Unknown
Becker, Frederick T. ....Duluth
† Becker, Kenneth Louis ....Rochester
Beckering, Gerrit ....Edgerton
Bedford, Fred G. ....Minneapolis
Beech, Raymond H. ....St. Paul
Beek, Harvey O. ....St. Paul
Beer, John J. ....St. Paul
† Beetham, William P., Jr. ....Rochester
Behmler, Frederick Wm. ....Morris
Behr, Orlo K. ....Crookston
Beirstein, Samuel ....Minneapolis
Beiswanger, Richard H. ....Minneapolis
† Belau, Paul G. ....Rochester
Belcher, Royden A. ....Little Falls
* Bell, Curry C. ....St. Paul
Bell, Donald C. ....Minneapolis
† Bell, Elexious T. ....Minneapolis
Bell, Harry M., Jr. ....Duluth
Bellomo, James ....St. Paul
Bellomo, John ....Fairmont
Bellville, Titus P. ....Minneapolis
Belzer, Meyer S. ....Minneapolis
Bender, James H. ....Brainerd
Bendix, Lester H. ....Annandale
† Benedict, William L. ....Rochester
Benell, Otto E. ....Virginia
Benepe, James L. ....St. Paul
Benesh, Louis A. ....Minneapolis
Benjamin, Edwin G. ....Minneapolis
Benjamin, Harold G. ....Minneapolis
Benjamin, Robert B. ....Minneapolis
Benjamin, Walter G. ....Pipestone
Benson, Alfred H. ....Little Falls
Benthack, Elaine M. ....St. Paul
Bepko, Marie K. (Mrs. Puumala) ....Cloquet
Berdez, George L. ....Duluth
Berg, Arnold M. ....Roseau
Berg, Clinton C. ....Wayzata
† Bergan, Otto ....Clinton
Bergan, Robert O. ....Duluth
Berge, David O. ....Roseau
Berge, Harry L. ....Mora
Berge, Kenneth G. ....Rochester
Berge, S. Matthew ....Rochester
Berger, Alex G. ....Minneapolis
Bergeron, Dale A. ....Le Sueur
Bergh, George S. ....Minneapolis
Bergh, Solveig M. ....Minneapolis
Berglund, Alvin E. ....Cambridge
Berglund, Eldon B. ....Minneapolis
Bergman, Oscar B. ....St. James
Bergquist, James R. ....Minneapolis
† Beringer, E. Duane ....Rochester
† Berke, Joseph J. ....Rochester
Berkman, David S. ....Rochester
Berkman, John M. ....Rochester
Berkwitz, Nathaniel J. ....Minneapolis
Berman, Irwin B. ....Rochester
Berman, Reuben ....Minneapolis
Berman, Stanley ....Rochester
Bernatz, Philip E. ....Rochester
Bernhisel, Harris G. ....St. Paul
Bernier, Merrill J. ....North St. Paul
Bernstein, Irving C. ....Minneapolis
Bernstein, William C. ....St. Paul
Berris, Harold ....Minneapolis
Berry, Jack T. ....Albert Lea
Bessesen, Alfred N., Jr. ....Minneapolis
Bevis, William D. ....Minneapolis
Bianco, Anthony J. ....Duluth
Bianco, Anthony J., Jr. ....Rochester
Bicek, Joseph F. ....St. Paul

Bickel, William H. ..... Rochester
*†Biedermann, Jacob ..... Austin
Bieter, Raymond N. ..... Minneapolis
† Bigelow, Charles E. ..... Dodge Center
Bigg, Richard L. ..... Rochester
† Biggs, Alfred D., Jr. ..... Rochester
Bigler, Earl E. ..... Perham
Bigler, Ivan E. ..... Perham
Bilka, Paul J. ..... Minneapolis
Billing, Harry H. ..... Red Wing
* Billings, Ralph E. ..... Franklin
Bilon, Thomas E. ..... Willmar
Binder, Manuel R. ..... Minneapolis
† Binet, Henry E. ..... Grand Rapids
Bingham, George C. ..... Bird Island
† Binger, Henry E. ..... Phoenix, Ariz.
† Birdsall, Charles J. ..... Rochester
Bissinger, Lester L. ..... Brainerd
Bittick, Wilbur H. ..... Minneapolis
Bjornson, Robert G. B. ..... Minneapolis
Black, B. Marden ..... Rochester
Black, Earl J. ..... St. Paul
Black, William A. ..... New Ulm
Blackburn, Charles M. ..... Rochester
Blackburn, Henry W., Jr. ..... St. Paul
Blackmore, Sidney C. ..... Biwabik
Blake, Allan J. ..... Hopkins
Blake, James A. ..... Hopkins
Blake, Paul S. ..... Hopkins
† Blakey, Adam R. ..... Osakis
Bledsoe, Francis H. ..... Rochester
Bloch, Henry S. ..... Minneapolis
Bloedel, Traugott J. ..... Osseo
Blomberg, Robert D. ..... Minneapolis
Blomberg, Wm. R. ..... St. Paul
Bloom, David ..... Minneapolis
Bloom, Joseph ..... Silver Bay
Bloom, Norman B. ..... Minneapolis
Blumberg, Henry B. ..... St. Paul
Blumenthal, Jacob S. ..... Minneapolis
Blumer, Arlo R. ..... Albert Lea
Boardman, Dalmon V. ..... Winona
† Bock, Rolland A. ..... St. Paul
Bodaski, Albert A. ..... Tyler
Boehrer, John J. ..... Minneapolis
Bofenkamp, Benjamin ..... Minneapolis
Bofenkamp, Ferdinand Wm. ..... Luverne
Bohn, Donald G. ..... Minneapolis
Boies, Lawrence R. ..... Minneapolis
Boline, Clifford A. ..... Battle Lake
† Bolsta, Charles ..... Ortonville
Bolstad, Owen C. ..... Little Falls
Bolz, J. Arnold ..... Grand Rapids
Boman, Paul G. ..... Duluth
Bonello, Frank J. ..... St. Paul
† Bonner, John L. ..... St. Paul
Boody, George, Jr. ..... Cambridge
Boolukos, George P. N. ..... Rochester
Boone, Ervin S. ..... Luverne
† Booth, Albert E. ..... Minneapolis
*†Boreen, Clifton A. ..... Minneapolis
Borg, Joseph F. ..... St. Paul
Borgerson, Arthur H. ..... Long Prairie
† Borgeson, Egbert J. ..... St. Paul
Borman, Chauncey N. ..... Minneapolis
Boroson, Hugh N. ..... Thief River Falls
Borowicz, Leonard A. ..... Minneapolis
Bosland, Howard G. ..... Willmar
† Bossert, Clarence S. ..... Mora
Bottolfson, Bottolf T. ..... Moorhead
† Bouma, Lewis R. ..... St. Paul
Bouquet, Bertram J. ..... Wabasha
Bouthilet, Florence J. ..... St. Paul
Bowen, Ralph Jr. ..... Rochester
Bowen, Robert L. ..... Hibbing
† Bowen, Stephen F., Jr. ..... Rochester
Bowers, Gordon G. ..... Minneapolis
Bowers, Robert N. ..... Lake City
Boyd, David A., Jr. ..... Rochester
Boyd, Frank E. ..... Jasper
Boyer, George S. ..... Crookston
Boyer, Samuel H., Jr. ..... Duluth
Boyle, Francis J. ..... Springfield
Boynton, Ruth E. ..... Minneapolis
Boysen, Herbert ..... Madelia
Bozanich, Milosh S. ..... St. Cloud
† Braasch, William F. ..... Rochester
Brabec, Paul F. ..... Hastings
Bradley, Jeanne B. ..... Minneapolis
Bradley, John G. ..... Minneapolis
† Brand, William A. ..... Redwood Falls
Brandenburg, Robert O. ..... Rochester
Brandt, Henry E. ..... Minneapolis
† Branham, Donald S. ..... Deer Park, Wis.
Brannick, Thomas L. ..... Rochester
† Bratrud, Arthur F. ..... Minneapolis
† Bratrud, Edward ..... Thief River Falls
Bratrude, Earl J. ..... St. James
Braun, Ohrmundt Carl ..... Grand Rapids
Brauti, Erling F. ..... Minneapolis
Bravick, Donald D. ..... Appleton, Wis.
† Bray, Elwyn R. ..... St. Paul
Bray, Philip N. ..... Duluth
Breitenbucher, Robert B. ..... Minneapolis
Brekke, Harvey J. ..... Minneapolis
Breslin, Donald J. ..... Rochester
Bretzke, Carl O. ..... Hutchinson
Bridge, Allyn G. ..... Minneapolis
Briggs, John F. ..... St. Paul
Brigham, Charles Fay, Jr. ..... St. Cloud
Brill, Alice K. ..... Minneapolis
Brink, Adlai A. ..... Baudette
Brink, Donald M. ..... Hutchinson
Broadbent, James C. ..... Rochester
Broadie, Thomas E. ..... St. Paul
Brockway, Roger W. ..... Grand Rapids
Brodhun, John C. ..... Rochester
Brodie, Walter D. ..... St. Paul
Broker, Henry M. ..... St. Cloud
† Brooker, Warren J. ..... Minneapolis
† Brookler, Morton I. ..... Rochester
† Brooks, Charles N. ..... Minneapolis
Brooks, Leonard J. ..... Virginia
Brown, Alexander E. ..... Rochester
Brown, Arnold L. ..... Rochester
Brown, Cyrus C., Jr. ..... Duluth
† Brown, David N. ..... Rochester
† Brown, Edgar D. ..... St. Petersburg, Fla.
Brown, Henry A. ..... Rochester
Brown, Ian A. ..... St. Paul
Brown, James E., Jr. ..... St. Paul
Brown, Joe R. ..... Rochester
† Brown, John C. ..... Los Gatos, Calif.
Brown, Philip W. ..... Rochester
Brown, Philip W., Jr. ..... Rochester
† Brown, Robert C. ..... Rochester
Brown, Russell T. ..... Browerville
Brown, William D. ..... Minneapolis
Bruhl, Heinz H. ..... Faribault
Brunsting, Louis A. ..... Rochester
Brusegard, James F. ..... Red Wing
Bryant, Emmett P. ..... Hibbing
Bucher, Foster D. ..... Starbuck
Buchstein, Harold F. ..... Minneapolis
† Buck, Frederick H. ..... Shakopee
Buckley, J. J. ..... Minneapolis
Buckley, Robert P. ..... Duluth
Buesgens, Ralph H. ..... Waterville
† Buie, Louis A. ..... Rochester
Buie, Louis A., Jr. ..... Rochester
Buirge, Raymond E. ..... Minneapolis
Bulinski, Theodore J. ..... St. Paul
Bunker, Bevan W. ..... Anoka
† Burbank, Mahlon K. ..... Rochester
Burch, Edward P., II ..... St. Paul
Burchell, Howard B. ..... Rochester
Buresh, Kenneth L. ..... Westbrook
Burgert, E. O., Jr. ..... Rochester
Burich, Harry F. ..... Rochester
† Burk, Emmett K. ..... Rochester
Burke, Edmund C. ..... Rochester
Burklund, Edwin C. ..... St. Paul
Burligame, David A. ..... St. Paul
Burman, Richard E. ..... Aitkin
Burmeister, Richard O. ..... St. Paul
Burnett, Joseph W. ..... New Ulm
Burnham, Wesley H. ..... Minneapolis
† Burnes, Edward A., Jr. ..... Rochester
† Burns, Catherine ..... Excelsior
Burns, Floyd M. ..... Milan
Burns, M. Alpheus ..... Milan
† Burns, Robert M. ..... St. Paul
Burseth, Edgar C. ..... Mora
Burton, Carl G. ..... St. Paul
Buscher, Julius C. ..... St. Cloud
Bush, Robert P. ..... St. Paul
Bushard, Wilfred J. ..... Minneapolis
Busher, Herbert H. ..... St. Paul
Butler, John K. ..... Cloquet
Butt, Hugh R. ..... Rochester
Butturff, Carl R. ..... Freeborn
† Butzer, John A. ..... Mankato
Butzer, John F. ..... Mankato
Buzzelle, Leonard K. ..... Minneapolis
Bynum, Grover L., Jr. ..... Rochester
Byrd, Richard B. ..... Rochester
Byrne, William F. ..... White Bear

Cable, Morris L. ..... Minneapolis
Cabot, Clyde M. ..... Minneapolis
Cadman, Norman L. ..... Rochester
* Cady, Laurence H. ..... Minneapolis
Cain, Clark L. ..... St. Paul
Cain, James C. ..... Rochester
Cain, James H. ..... Alexandria
Cairns, Robert J. ..... Redwood Falls
† Caldarola, Vincent T. ..... Rochester
† Calhoun, Frank W. ..... Albert Lea
Calin, Stanford H. ..... St. Paul
Callahan, Francis F. ..... St. Paul
Callahan, John A. ..... Rochester
Callan, Joseph A. ..... Virginia
† Callewart, Robert A. ..... Minneapolis
‡ Calverley, John R. ..... San Antonio, Texas
Cameron, Isabell L. ..... Minneapolis
Cameron, John H. ..... Crookston
† Camp, John D., Jr. ..... Rochester
Camp, Ray J. ..... Madison
Campaigne, Robert J. ..... Duluth
Campbell, Dennis V. ..... Fergus Falls
Campbell, Donald C. ..... Rochester
Campbell, Frederick W. ..... Minneapolis
† Campbell, Lowell M. ..... Minneapolis
Campbell, Malcolm K. ..... Rochester
Campbell, Orwood J. ..... Minneapolis
Campbell, Wayne L. ..... Waseca
Canfield, Wayne W. ..... St. Peter
Canine, James Lee ..... So. St. Paul
Cantwell, Wm. F. ..... International Falls
Caplan, Leslie ..... Minneapolis
Card, William H. ..... Minneapolis
Cardle, George E. ..... Brainerd
Carey, James B., Jr. ..... Minneapolis
Carlander, Lester W., Jr. ..... Minneapolis
Carley, Walter A. ..... St. Paul
Carlon, Donald L. ..... Willmar
Carlson, Carl E. ..... Alexandria
Carlson, Charles V. ..... Mound
Carlson, Homer J. ..... Pelican Rapids
Carlson, John V. ..... Westbrook
Carlson, Lawrence ..... Minneapolis
Carlson, Leonard T. ..... Minneapolis
‡ Carlson, Robert G. ..... Seattle, Wash.
Carlson, Russel E. ..... Stillwater
Carlson, Vernon J. ..... Moorhead
Carnevali, John F. ..... Rochester
Caron, Robert P. ..... Minneapolis
† Carpenter, William B. ..... Rochester
Carr, David T. ..... Rochester
Carr, Wm. J. ..... Minneapolis
Carroll, John J. ..... Winsted
Carryer, Haddon McCutchen ..... Rochester
Carthey, Frank J. ..... New Ulm
Carveth, Stephen W. ..... Rochester
Casdorph, Herman R. ..... Rochester
Casey, John J. ..... Ivanhoe
† Casey, Thomas H. ..... Rochester
Caspers, Carl G. ..... Minneapolis
† Catlin, John J. ..... Buffalo
Catlin, Theodore J. ..... Buffalo
Cauble, Charles F. ..... Minneapolis
† Cavanor, Frank T. ..... Minneapolis
Cedarleaf, Cherry B. ..... Mahtomedi
Ceder, Elmer T. ..... Minneapolis
Cella, Joseph A. ..... Minneapolis
Ceplecha, Stanley F. ..... Redwood Falls
Cervenka, Charles F. ..... New Prague
Cesnik, Robert J. ..... Sauk Rapids
Chadbourn, Charles R. ..... St. Paul
Chadbourn, Wayne A. ..... Minneapolis
Chalgren, William S. ..... Mankato
Challman, Samuel A. ..... Minneapolis
† Chambers, Winslow C. ..... Blue Earth
Chappell, Elliott Rae ..... Stillwater
† Chatterton, Carl C. ..... St. Paul
† Chavez, Demetrio A. ..... St. Paul
Chermak, Francis G. ..... International Falls
Chervenak, William A. ..... Winsted
Chesler, Merrill D. ..... Minneapolis
Child, Sherman B. ..... Minneapolis
Childs, Donald S., Jr. ..... Rochester
Chisholm, Tague C. ..... Minneapolis
Christensen, Clarence H. ..... Duluth
Christensen, Eli E. ..... Winona
Christensen, Llewellyn E. ..... Minneapolis
Christensen, Norman A. ..... Rochester
Christenson, Leland R. ..... Maple Plain
Christiansen, Andrew ..... St. Paul
Christiansen, Harold A. ..... Jackson
† Chrzan, Donald J. ..... Iowa City, Iowa
Chunn, Stanley S. ..... Willmar
Ciriacy, Edward W. ..... Ely
Clagett, Oscar T. ..... Rochester
Clapp, Hubert D. ..... Crookston
Clark, Edward C. ..... Rochester
Clark, Elizabeth A. ..... Duluth
Clark, Harry B. ..... St. Cloud
Clark, Henry B., Jr. ..... Minneapolis
Clark, Ivan T. ..... Duluth
Clark, Lealand L. ..... Rochester
Clark, Leslie W. ..... Manchester, Iowa
Clark, Malcolm D. ..... Minneapolis
Clark, Robert S. ..... Minneapolis
Clarke, John W. ..... Waconia
Clay, Lyman B. ..... Minneapolis
Cleaves, William D. ..... Sauk Centre
Clifford, George W. ..... Alexandria
† Clifton, Theodore A. ..... Hollywood, Fla.
Closuit, Frederick C. ..... Aitkin
‡ Clowdus, Bernard F., II ..... Rochester
Cochrane, Byron B. ..... St. Paul
Cochrane, Ray F. ..... Minneapolis
Coddon, Walter D. ..... St. Paul
† Cody, D. Thane ..... Rochester
Coe, John I. ..... Minneapolis
Coffey, William F. X. ..... Rochester
Cohen, Bernard A. ..... Minneapolis
† Cohen, Donald M. ..... Rochester
Cohen, Ellen K. ..... Rochester
Cohen, Ellis N. ..... St. Paul
Cohen, Ephraim B. ..... Minneapolis

Cohen, Henry W.....Minneapolis
Cohen, Hyman L.....Rochester
Cohen, Maynard M.....Minneapolis
Cohen, Sumner S.....Oak Terrace
Colby, M. Y., Jr.....Rochester
Colby, Woodard L.....St. Paul
Cole, James S.....Minneapolis
Cole, Wallace H.....St. Paul
Coleman, John B.....St. Paul
Coll, James J.....Duluth
† Collie, Henry G.....St. Petersburg, Fla.
† Collins, Arthur N.....Duluth
† Collins, Joseph S.....Wabasha
Colman, Edward L.....Fergus Falls
Conley, Francis W.....Duluth
Conley, Robert H.....Mankato
Connolly, Coleman J.....St. Paul
Connolly, Daniel C.....Rochester
Connolly, Joseph P.....South St. Paul
Connor, Charles E.....St. Paul
Connor, P. James.....Rochester
Cook, C. Kenneth.....St. Paul
Cook, Edward N.....Rochester
Cook, Jay M.....Staples
Coombs, Carl H.....Cass Lake
Cooper, Charles C.....St. Paul
Cooper, Harold G.....Duluth
Cooper, John P.....Minneapolis
*† Cooper, Maurice D.....Winnebago
Cooper, Robert R.....Minneapolis
Cooper, Talbert.....Rochester
Cope, Hershel B.....Virginia
Corbin, Kendall B.....Rochester
Corniea, Albert D.....Minneapolis
‡ Corr, William P.....San Francisco, Calif.
Correa, Dale H.....Minneapolis
Corrigan, Cyril J.....Rochester
Cosgriff, James A.....Olivia
Cosgriff, James A., Jr.....Olivia
Cottor, Robert E.....Stillwater
‡ Cottone, Francis J.....Rochester
Coughlin, Dennis, Jr.....Rochester
Coulter, Harold E.....Madelia
† Countryman, Roger S.....Saratoga, Calif.
Courteau, Robert D.....Onamia
Coventry, Markham B.....Rochester
Coventry, William D.....Duluth
Covey, Kenneth W.....Crookston
Cowan, Donald W.....Minneapolis
Cowan, George M.....Duluth
Craig, C. C.....International Falls
Craig, David M.....St. Paul
Craig, M. Elizabeth.....Minneapolis
*† Craig, Winchell M.....Rochester
Crandall, Earle E.....Rochester
† Cranmer, Richard R.....Minneapolis
Cranston, Robert W.....Minneapolis
Cranston, Robert W., III.....Duluth
Creevy, Charles D.....Minneapolis
Cronwell, Bernard J.....Austin
Crook, Rudolph L.....Duluth
Crow, Earl Roy.....Ah-Gwah-Ching
Crowley, James H.....St. Paul
Crudo, Vincent D.....St. Paul
Crump, James W.....St. Paul
Cullen, Robert M.....Wells
Culligan, Leo C.....Minneapolis
Culp, Ormond S.....Rochester
Culver, Lucian G.....St. Paul
Cumming, E. Dale.....St. Paul
Cundy, Donald T.....Minneapolis
Curtis, Rauen A.....Le Center
Cushing, Richard T.....Minneapolis
† Cushing, Robert L.....Walnut Creek, Calif.
† Cutts, George.....Minneapolis

Daehlin, Rolf.....Fergus Falls
† D'Agostino, Anthony.....Rochester
Daggett, Donald R.....Minneapolis
Dahl, Diane A.....Mahtomedi
Dahl, Elmer O.....Minneapolis
Dahl, James C.....Minneapolis
Dahl, John A.....Minneapolis
Dahlin, David C.....Rochester
*† Daignault, Oscar.....Benson
Dale, Les N.....Red Lake Falls
Daly, David D.....Rochester
† Damron, John C.....Rochester
† Daniel, Donald H.....Minneapolis
† Danielson, Karl A.....Litchfield
Danielson, Lennox.....Litchfield
Danyluk, Michael.....Minneapolis
Dargay, Cyril P.....Minneapolis
Daugherty, Guy W.....Rochester
David, Reuben.....Hopkins
Davidson, Paul.....Rochester
Davidson, William D.....St. Joseph
Davis, Arthur E., Jr.....St. Cloud
† Davis, Austin C.....Pampano Beach, Fla.
Davis, Edward V.....St. Paul
Davis, Eunice A.....Minneapolis
Davis, George D.....Rochester
Davis, Jay C.....Minneapolis
Davis, Lloyd T.....Wadena
Davis, Luther F.....Wadena
Davis, Raymond D.....Waseca
Davis, William I.....Moose Lake
Dawson, James R.....St. Paul
Dawson, Lorin D.....Worthington
Dearing, William H., Jr.....Rochester
Deason, Keith B.....Chisago City
Decker, Charles H.....St. Paul
Decker, David G.....Rochester
Degallier, Daniel.....Winona
† Degnan, Thomas J.....Rochester
Dehnel, Luther L.....Minneapolis
† de la Vega, Daniel J.....Rochester
Delmore, John L., Jr.....Roseau
del Plaine, Carlos W.....Minneapolis
DeMarais, Lloyd C.....Hibbing
Demo, Robert A.....Albert Lea
Derauf, Benjamin I.....St. Paul
Derauf, Donald E.....St. Paul
Deters, Donald C.....St. Paul
Deutsch, Robert J.....Duluth
Devereaux, Thomas J.....Wayzata
Devine, Kenneth D.....Rochester
† De Wall, Richard A.....Minneapolis
DeWeerd, James H.....Rochester
DeWeese, Wilford J.....Bemidji
deWerd, Robert W.....Owatonna
Dewey, Donald H.....Owatonna
Dickman, Roy W.....Minneapolis
Dickson, Franklin H., Jr.....Proctor
† Dickson, Harrison M.....Rochester
Diefenbach, Eugene J., Jr.....Minneapolis
Diehl, Harold S.....New York City, N. Y.
Dierker, Heinrich A.....Minneapolis
Diessner, Ardell W.....Redwood Falls
Diessner, Grant R.....Rochester
Diessner, Henry D.....Minneapolis
Dille, Donald E.....Litchfield
Dillenburg, C. J.....Little Falls
Divertie, Matthew B.....Rochester
Dixon, Claude F.....Rochester
Doan, Robert English.....Wayzata
Dobler, Manfred G.....Ely
Dobson, Mervin W.....Mankato
Dockerty, Malcolm B.....Rochester
Docksey, John W.....Willmar
† Dodds, Joseph J.....Rochester
Dodds, William C.....Detroit Lakes
Dodson, Albertus F.....Brainerd
Doerr, Gerhard M.....St. Paul
Doherty, Elmer M.....New Prague
Dokken, James H.....Windom
Doman, Victor W.....Lakefield
Dombrowski, Edmund T.....Rochester
Doms, Vernon A.....Elbow Lake
Donaldson, Charles S.....St. Cloud
Donatelie, Edward P.....Minneapolis
Donoghue, Francis E.....Rochester
Donovan, Daniel L.....Albert Lea
Dordal, John.....Sacred Heart
Dorge, Richard I.....Minneapolis
Dorsey, George C.....Minneapolis
Dorsey, George C., Jr.....Minneapolis
Doscherholmen, Alfred.....Minneapolis
Douglass, Bruce E.....Rochester
Douglass, Jesse E.....Cannon Falls
† Doxey, Gilbert L.....Minneapolis
Doyle, James R.....Rochester
Doyle, Lawrence O.....Minneapolis
Drake, Carl B.....St. Paul
† Drake, Charles R.....Minneapolis
Drexler, Charles J.....Litchfield
Drexler, George W.....Blue Earth
Drill, Herman E.....Hopkins
† Drips, Della G.....Oronoco
Dry, Thomas J.....Cape Town, Africa
† DuBois, Julian F.....Sauk Centre
DuBois, Julian F., Jr.....Sauk Centre
Duff, Edwin R.....Minneapolis
Dummer, Donald J.....New Brighton
† Dumont, Guy.....Rochester
Duncan, James W.....Moorhead
Dunlap, Earl H.....Minneapolis
Dunn, Robert C.....St. Paul
Dunstan, Paul L.....Willmar
Dupont, Joseph A.....Excelsior
Duryea, Marbry.....Minneapolis
Duryea, Willis M.....Minneapolis
Duryea, Willis M., Jr.....Minneapolis
DuShane, James W.....Rochester
Dvorak, Benjamin A.....Minneapolis
Dwan, Paul F.....Minneapolis
Dworsky, Samuel D.....Minneapolis
Dwyer, John J.....Duluth
Dyer, John Allen.....Rochester
Dyrdal, Paul J.....St. Paul
Dysterheft, Adolf F.....Gaylord

Earl, George A.....St. Paul
Earl, John R.....St. Paul
Eberley, Tobe S.....Benson
† Eberlin, Edward A.....Glenwood
Eckdale, John E.....Marshall
Eckman, Philip F.....Duluth
Eckman, Ralph J.....Duluth
Eddy, Richard L.....Alexandria
Eder, Walter P.....Minneapolis
Edwards, Jesse E.....Rochester
Edwards, Joseph W.....St. Paul
Edwards, Lloyd G.....St. Paul
Edwards, Robert V.....Crookston
Edwards, Thomas J.....St. Paul
Eelkema, Herman H.....St. Paul
‡ Efteland, Myles E.....Taiwan, Formosa
Egge, Sanford G.....Albert Lea
Eginton, Charles T.....St. Paul
Ehrenberg, Claude J.....Minneapolis
Ehrlich, S. Paul.....Minneapolis
Eich, Matthew A.....Minneapolis
Eichhorn, Edmund P., Jr.....Minneapolis
Eide, O. A.....Hancock
Eisenman, Walter.....Hibbing
Eisenstadt, David H.....Minneapolis
Eisenstadt, William S.....Minneapolis
Eitel, George D.....Minneapolis
† Ekblad, John W.....Rock Island, Ill.
Eklund, Carl D.....Duluth
Ekstrand, Leroy M.....Wabasha
Eli, Earl W.....Minneapolis
Elias, Frank J.....Duluth
Elkins, Earl C.....Rochester
Ellertson, Leonard M.....Albert Lea
Ellinger, Albert J.....Willmar
Elliott, Harold J.....Hayfield
Ellis, Earl W.....Elgin
Ellis, F. Henry.....Rochester
Ellison, David E.....Minneapolis
Ellison, Ellis.....Minneapolis
Ellison, Evan S.....Minneapolis
Ellison, Frank E.....Monticello
Ellwood, Paul M., Jr.....Minneapolis
Elrod, Calvin R.....Burbank, Calif.
*† Elsey, James R.....Glenwood
Emanuel, Karl W.....Duluth
Emerson, Edward C.....St. Paul
Emerson, Edwin E.....Osakis
Emmett, John L.....Rochester
Emmons, R. W.....St. Paul
Emond, Albert J.....Farmington
Emond, Joseph S.....Farmington
Endress, Edward K.....St. Paul
Engberg, Edward J.....Faribault
Engel, Joseph P.....Minneapolis
Engelhart, P. C.....Minneapolis
Engelstad, Wendell P.....Virginia
Engler, Robert S.....Rochester
Englund, Elvin F.....Minneapolis
Englund, Garth W.....Mabel
Engstrand, Oscar J.....Minneapolis
Engstrom, Robert B.....Mankato
Enroth, Oscar E.....St. Paul
Engwall, Richard.....Ivanhoe
Eppard, Raymond M.....Cloquet
Erdal, Ove A.....Albert Lea
Erich, John B.....Rochester
Erickson, Alvin O.....Long Prairie
Erickson, Clifford O.....Minneapolis
Erickson, Donald J.....Rochester
* Erickson, Eskil.....Halstad
Erickson, George P.....Hibbing
Erickson, Laurence F.....Minneapolis
Erickson, Myron E.....Minneapolis
Erickson, Reuben F.....Minneapolis
Erickson, Vernon D.....Grand Rapids
† Ericson, Swan.....Los Angeles, Calif.
Erlanson, Andrew C.....Hibbing
† Ernest, George C. H.....Lakeland, Fla.
Ersfeld, Murray P.....St. Paul
Esensten, Sidney.....Minneapolis
† Eshelby, E. C.....St. Paul
Estes, J. Earle, Jr.....Phoenix, Ariz.
Estrem, Ralph L.....Fergus Falls
Estrem, Robert D.....Fergus Falls
Etzwiler, Donnell D.....Minneapolis
† Eusterman, George B.....Rochester
Eustermann, John J.....Mankato
Evans, Edward T.....Minneapolis
Evans, Leslie M.....Sauk Rapids
Evans, Robert D.....Minneapolis
† Evarts, Arrah B.....Rochester
Evenson, David J.....Rochester
Evensta, John B.....Grand Rapids
Ewens, George B.....Virginia

Faber, John E.....Rochester
† Fahr, George E.....Minneapolis
Fairbairn, John F.....Rochester
Falk, Abraham.....St. Paul
Fallon, Virgil T.....Dawson
Falls, John L.....Red Wing
Fansler, Walter A.....Minneapolis
Farkas, John V.....St. Paul
† Farmer, John L., Jr.....Rochester
Fasenbender, Herman T.....Hastings
† Fatum, Paul J.....Rochester

* Faucett, Robert L.....Rochester
Faulconer, Albert, Jr.....Rochester
Faust, Herbert A.....Rochester
Fawcett, Arthur M.....Renville
Fawcett, Keith R.....Duluth
Fedor, Robert D.....Litchfield
Fee, John G.....St. Paul
Feeney, John M.....Minneapolis
Feigal, David W.....Wayzata
Feigal, William M.....Fairmont
Feinberg, Philip.....Minneapolis
Feinberg, Samuel B.....Minneapolis
‡ Feinerman, Burton.....Miami Beach, Fla.
Feinstein, Julius Y.....Minneapolis
Felder, Davitt A.....St. Paul
Feldmann, Floyd M.....New York
Felion, Arthur J.....St. Paul
Fellows, Manley F.....Duluth
Fenger, Ejvind P. K.....Oak Terrace
Ferguson, Richard H.....Rochester
Ferguson, William C.....Walnut Grove
Ferrand, Paula T.....Moose Lake
Ferris, Deward O.....Rochester
Fesenmaier, Otto B.....New Ulm
Fesler, Harold H.....St. Paul
Feuling, John C.....Duluth
* Fidelman, Norman E.....Foley
Field, Anthony Hugh.....Farmington
Field, Charles W.....Minneapolis
Fifer, William R.....Minneapolis
Fifield, Malcolm M.....Duluth
† Figi, Frederick A.....Rochester
Fingerman, David L.....Minneapolis
Fink, Daniel L.....St. Paul
Fink, Leo W.....Minneapolis
Fink, Robert J.....Minneapolis
Fink, Walter H.....Minneapolis
Finkelnburg, William O.....Winona
Fisch, Herbert M.....Austin
Fischer, John R.....Blooming Prairie
Fischer, Mario M.....Duluth
Fischer, Robert F.....St. Paul
Fischer, Dan W.....St. Paul
Fischer, Don H.....Minneapolis
Fisher, Isadore I.....Minneapolis
Fisketti, Henry.....Duluth
Fitzsimons, William E., Jr.....Brainerd
† Fjeldstad, Christian A.....Minneapolis
Flanagan, Harold F.....St. Paul
Flanagan, Leonard G.....Austin
Flanary, Lawrence M.....Chisholm
Flancher, Leon H.....Crookston
Flannery, Hubert F.....St. Paul
Flatt, John R.....Wabasha
Fleeson, William H.....Minneapolis
Fleming, Dean S.....Hopkins
*† Fleming, Thomas N.....St. Cloud
Fliehr, Richard R.....Minneapolis
Flink, Edmund B.....Minneapolis
Flinn, James B.....Redwood Falls
† Flinn, Thomas E.....Remer
Floersch, Adrian J.....Owatonna
Flom, Reynold P.....St. Paul
Flom, Robert S.....St. Paul
† Florine, Martin C.....Panama, Canal Zone
Fluegel, John O.....Rochester
Flynn, Bernard F.....Hibbing
Flynn, Louis L., Jr.....St. Paul
Flynn, Robert A.....St. Paul
Foderick, Peter P.....Hallock
† Fogarty, Charles W.....St. Paul
Fogarty, Charles W., Jr.....St. Paul
Fogelberg, Emil J.....St. Paul
Foker, Leslie W.....Minneapolis
Foley, Frederic E. B.....St. Paul
* Folken, Frank G.....Albert Lea
Folsom, Louis B.....Minneapolis
† Fons, Anthony L., III.....Rochester
Ford, Burton C.....Marshall
Ford, F. Wendell.....New London
Ford, William H.....Minneapolis
Forsythe, James R.....St. Paul
Fortier, George M. A.....Little Falls
Fortier, Rene G.....Mankato
Foss, Edward L.....Rochester
Foster, Orley W.....Minneapolis
Foulk, William T., Jr.....Rochester
† Fowler, Lucius H.....Newport Beach, Calif.
† Fox, Donald P.....Tanganyika, East Africa
Fox, James R.....Minneapolis
Fox, LeRoy J.....St. Paul
† Fox, Nelson M., Jr.....Rochester
† Franchere, Frederick W.....Lake Crystal
Francis, David W.....Morristown
† Francis, Robert L.....Rochester
Franckowiak, John J.....Rochester
Frane, Donald B.....Minneapolis
Franklin, Gordon W.....Northome
Fredericks, George M.....Minneapolis
Frederickson, Alice C.....Willmar
Freeman, Charles D., Jr.....St. Paul
Freeman, Donald W.....St. Louis Park
† Freeman, John P.....Glenville
Freemen, Craig W.....Minneapolis
French, Bayard T.....Hibbing
French, Lyle A.....Minneapolis
Frethem, Allen A.....Rochester
Frey, Richard J.....Minneapolis
Friberg, Joseph B.....Minneapolis
Fricke, Robert E.....Rochester
Fried, Louis A.....Minneapolis
Friedell, Aaron.....Minneapolis
Friedell, George.....St. Louis Park
Friedlieb, Oskar P.....Virginia
Friedman, Harry S.....Minneapolis
Friesen, Gerhard.....Rochester
Frischknecht, Albert.....Rochester
Fritsche, Albert.....New Ulm
Fritsche, Carl J.....New Ulm
Fritsche, Theodore R.....New Ulm
Fritz, Wallace L.....St. Paul
Froats, Charles W.....St. Paul
Frost, John B.....Minneapolis
Frost, Russell H.....St. Paul
Frykman, Howard M.....Minneapolis
† Fryling, Vera B.....Talmage, Calif.
Frys, Russell N.....Minneapolis
† Fuller, Alice H.....Minneapolis
Fuller, Benjamin F.....St. Paul
Fuller, Josiah.....Duluth
Funk, Victor K.....Oak Terrace
Furlow, William I.....Faribault
Furman, Lucie C.....Minneapolis
Furr, Leo O.....Bird Island
Fusaro, Ramon M.....Minneapolis

Gaard, Richard C.....Minneapolis
Gaebe, Milton B.....Clara City
Gaida, Jos. B.....St. Cloud
Gailitis, Veronika M.....Cambridge
† Galbraith, Richard F.....Rochester
Galejs, Aina.....Minneapolis
† Gallagher, Bernard J.....Waseca
Gallett, Lester E.....Minneapolis
Galligan, John J.....St. Paul
† Galligan, Margaret M.....Minneapolis
† Gambill, Carl M.....Rochester
Gambill, Earl E.....Rochester
Gamble, Elbert J.....Albert Lea
Gammell, John H.....Minneapolis
Gannon, Paul G.....Rochester
Garamella, Joseph J.....Minneapolis
Garbrecht, Arthur W.....St. Paul
Gardner, Jack K.....Fairmont
Gardner, Victor H., Sr.....Fairmont
Gardner, Walter P.....St. Paul
Garrow, Douglas M.....St. Paul
Garske, George L.....Minneapolis
Garten, Joseph L.....Minneapolis
Garvey, James T.....Minneapolis
Gastineau, Clifford F.....Rochester
Gatzke, Laurence D.....Rochester
Gault, N. L., Jr.....San Francisco, Calif.
† Gault, Sarah Jane.....San Francisco, Calif.
Gaviser, David.....Minneapolis
† Gedge, Stafford W.....Rochester
Gehlen, Joseph N.....St. Paul
Geib, Marvin J.....Fargo, N. D.
Geiser, Peter M.....Alexandria
Geller, Joseph.....Minneapolis
George, Vane P., Jr.....Minneapolis
Geraci, Joseph E.....Rochester
Gerber, Edward P.....Arizona
Gerend, Thomas J.....Virginia
Geurs, Benjamin R.....Mankato
† Ghostley, Mary C.....Santa Ana, Calif.
Gibbs, Edward C.....St. Paul
Gibbs, Robert W.....Minneapolis
Giebenhain, John N.....Minneapolis
Giere, Joseph C.....Minneapolis
Giere, Richard W.....Minneapolis
Giere, Silas W.....Benson
† Giffin, Herbert Z.....Rochester
Gifford, R. W., Jr.....Rochester
Gilbert, Maurice G.....Minneapolis
Gilbertsen, A. Sigrid.....Minneapolis
Gilbertsen, Victor A.....Minneapolis
Giles, William F.....Rochester
† Gill, Charles R.....Rochester
Gill, Theodore.....Albert Lea
Gillespie, Delmar R.....St. Paul
Gillespie, Malcolm G.....Duluth
Gilloon, James R.....Rochester
Gilman, Lloyd C.....Willmar
Gilsdorf, Donald A.....St. Paul
Gingold, Benjamin A.....Minneapolis
Gislason, Paul H.....Mankato
Gislason, Solveig T.....St. Peter
Gierde, William P.....Lake City
Glabe, Robert A.....Plainview
Glaeser, John H.....Minneapolis
Gleason, Wallace A.....St. Paul
Glick, Dallas D.....Rochester
Goblirsch, Andrew P.....Sleepy Eye
Godfrey, H. Wilson.....Minneapolis
Goehrs, Gilman H.....St. Cloud
† Goehrs, Henry W.....St. Cloud
† Goethals, Paul L.....Rochester
Gold, David.....Minneapolis
Goldberg, Isadore M.....Minneapolis
Goldberg, Marvin E.....Minneapolis
Golden, Jules S.....St. Paul
Goldish, Daniel R.....Duluth
Goldish, Robert J.....Duluth
Goldman, Theodore I.....Minneapolis
Goldner, Meyer Z.....Minneapolis
Goldschmidt, Volker.....Duluth
Goldsmith, Joseph W.....St. Paul
Goldstein, Alan.....Minneota
Goldstein, Norman P.....Rochester
† Goltz, Edward V.....St. Paul
Goltz, Robert W.....Minneapolis
Good, C. Allen, Jr.....Rochester
Good, Gary.....Minneapolis
Good, Hoff D.....Minneapolis
Good, Roy H.....Northfield
Goodchild, William R.....Minneapolis
Goodman, Charles E.....Virginia
Goodman, Ernest.....St. Paul
Goodnow, William H.....Duluth
Gorchynski, Orest.....Milaca
† Gordon, Alan L.....Rochester
Gordon, John R.....Minneapolis
Gordon, Philip E.....Minneapolis
Gordon, Sewell S.....St. Louis Park
Gould, Allan B., Jr.....Rochester
Gowan, Lawrence R.....Duluth
† Graham, Archibald W.....Chisholm
Graham, Asa B.....Faribault
Grahek, Jack P.....Ely
† Granberry, W. Malcolm.....Rochester
† Granquist, Richard D.....Minneapolis
Grant, Hendrie W.....St. Paul
Grant, John Carton.....Sauk Centre
Grant, Suzanne.....Minneapolis
† Gratzek, Frank R.....Anoka
*† Gratzek, Thomas.....St. Paul
* Grau, Robert K.....St. Paul
Graudins, Gunars.....Rochester
Gray, Edward F.....White Bear
† Gray, Frank D.....Marshall
Gray, Royal C.....Minneapolis
Green, Clayton R.....Excelsior
Green, Paul.....Rochester
Green, Robert A.....St. Louis Park
Greenberg, Albert J.....Minneapolis
Greene, Daniel E.....Thief River Falls
Greene, Laurence F.....Rochester
Greene, Leonard H.....Minneapolis
Greenfield, Irving.....Minneapolis
Greenfield, William T.....Cokato
Greenspan, Richard H...New Haven, Conn.
† Gregg, James A.....Rochester
¶ Greishiemer, Esther M.....Philadelphia, Pa.
Gridley, John W.....Arlington
Griebie, Grant L.....Brownton
Griffin, John W., Jr.....Bemidji
Griffin, Richard P.....Benson
Grimes, Burton P.....St. Peter
Grimes, Marian.....Minneapolis
Grimes, Paul T.....Park Rapids
Grimmell, Francis J.....Minneapolis
Grindlay, John H.....Rochester
Grinley, Andrew V.....Grand Rapids
Grismer, Jerome T.....Minneapolis
Grohs, William H.....Duluth
Gronquist, Y. K. J.....Cloquet
Gronvall, Paul R.....Minneapolis
Groschupf, Richard P.....Bemidji
Groschupf, Theodore P.....Bemidji
Grose, Frederick N.....Clarissa
Gross, John B.....Rochester
Grotting, John K.....Minneapolis
Gruys, Robert I.....Minneapolis
Guenther, Dean E.....St. Paul
Guilfoile, Pierre J.....Delano
Guldseth, Gustav J.....Hendricks
† Gullickson, Andrew.....Minneapolis
Gullickson, Glenn, Jr.....Minneapolis
Gunlaugson, Frederick G.....Minneapolis
Gustafson, Paul O.....Minneapolis
Gustafson, Robert W.....Fairmont
Gustason, Harold T.....Minneapolis
† Gutman, Arnold A.....Rochester
Guy, Jack A.....New London

Haas, Jack F.....Northfield
Haase, Donald D.....Silver Bay
Haavik, John E.....Duluth
Habein, Harold C.....Wabasha
Haberer, Helen R.....Minneapolis
Haberle, Charles A.....Minneapolis
† Haberman, Emil.....Osakis
Haes, Julius E.....St. Peter
Haesly, Warren W.....Winona
Hagan, Paul S.....St. Paul
Hagberg, Norman L.....Montevideo
Hagedorn, Albert B.....Rochester
Hagen, John D.....Austin
† Hagen, Olaf J.....Moorhead

Hagen, Wayne S. ..... Minneapolis
† Haggard, George D. ..... Minneapolis
† Haines, Samuel F. ..... Rochester
Hakanson, Erick Y. ..... St. Paul
Halbert, John J. ..... Duluth
Halenbeck, Philip L. ..... St. Cloud
Hall, Barnard ..... St. Paul
Hall, Harry B. ..... Minneapolis
Hall, John J. ..... Onamia
Hall, Wendell H. ..... Minneapolis
Hall, William E. ..... St. Paul
Hallberg, Olav E. ..... Rochester
† Hallenbeck, Dorr F. ..... Rochester
Hallenbeck, George A. ..... Rochester
Halliday, Phillip V. ..... Duluth
Hallin, Roger P. ..... Worthington
Halloran, Walter H. ..... Jackson
Halme, William B. ..... Wadena
Halper, Bernard ..... Hibbing
Halpern, David J. ..... Brewster
Halpin, Joseph E. ..... Rush City
Halvorsen, Daniel K. ..... Owatonna
Halverson, Donald E. ..... Winnebago
Halverson, Kermit J. ..... Chisholm
Halverson, William G. ..... Madelia
Halvorson, Harold C. ..... Luverne
Halvorson, James W. ..... Zumbrota
Hambidge, Gove, Jr. ..... Minneapolis
Hamel, Joseph I. ..... Minneapolis
Hamilton, Samuel L. ..... Red Wing
‡ Hamilton, Warren W., Jr. ..... St. Albans, N. Y.
Hamlon, John S. ..... Fergus Falls
Hammar, Lawrence M. ..... Mankato
Hammerstad, Lynn M. ..... Minneapolis
Hammerstrom, Robert N. ..... Minneapolis
Hammes, Ernest M. ..... St. Paul
Hammes, Ernest M., Jr. ..... St. Paul
† Handler, Seymour ..... Minneapolis
† Haney, Claude L. ..... Duluth
Hankerson, Robert G. ..... Minnesota Lake
Hanlon, David G. ..... Rochester
Hannah, Hewitt B. ..... Minneapolis
Hannon, Donald W. ..... St. Paul
Hanover, Ralph D. ..... International Falls
Hansen, Cyrus O. ..... Minneapolis
Hansen, Erling W. ..... Minneapolis
Hansen, Milo L. ..... Little Falls
Hansen, Olga S. ..... Minneapolis
Hansen, Robert E. ..... Hibbing
Hansen, Rollin M. ..... Minneapolis
Hansen, Theodore M. ..... Albert Lea
Hanske, Edward A. ..... Minneapolis
Hanson, Ernest O. ..... Cloquet
Hanson, Everett C. ..... New York Mills
Hanson, Harlow J. ..... Minneapolis
Hanson, Harold B. ..... Minneapolis
Hanson, Harold W. ..... Minneapolis
† Hanson, Henry V. ..... St. Paul
Hanson, John W. ..... Northfield
Hanson, Lewis ..... Frost
Hanson, Malcolm B. ..... Minneapolis
Hanson, Mark C. ..... Minneapolis
Hanson, Norbert O. ..... Rochester
Hanson, William A. H. ..... Minneapolis
Hanson, William B. ..... Minneapolis
Happe, Lawrence J. ..... Minneapolis
† Harbaugh, John T. ..... Minneapolis
Hargraves, Malcolm M. ..... Rochester
Harmon, Gaius E. ..... St. Paul
† Harrington, Stuart W. ..... Rochester
Harrington, Vernon A., Jr. ..... Duluth
Harris, John E. ..... Minneapolis
Harris, Leon D. ..... Minneapolis
Harris, Lloyd E. ..... Rochester
Harrison, Edgar G., Jr. ..... Rochester
Harrison, Percy W. ..... Worthington
Harrison, William C. ..... Minneapolis
Hart, William E. ..... Monticello
Hartfiel, William F. ..... St. Paul
Hartig, Marjorie ..... St. Paul
Hartjen, Jason K. ..... Bemidji
Hartman, Evelyn E. ..... Minneapolis
*†Hartman, Howard R. ..... Rochester
Hartnagel, Grant F. ..... Red Wing
Hartridge, Virginia B. ..... Rochester
Hartung, Elmer H. ..... Claremont
Hartwich, Roger F. ..... Winona
Hartwig, John A. ..... Minneapolis
† Hartzell, John M. ..... Rochester
Hass, Frederick M. ..... Minneapolis
*†Hassett, Roger G. ..... Solona Beach, Calif.
Hastings, DeForest R. ..... Minneapolis
Hastings, Donald W. ..... Minneapolis
† Hatch, Walter E. ..... Duluth
Haugan, Norman R. ..... Park Rapids
Hauge, Erling T. ..... Minneapolis
Hauge, Malvin I. ..... Clarkfield
Haugen, George W. ..... Minneapolis
Haugen, John A. ..... Minneapolis
Hauser, Donald C. ..... Minneapolis
Hauser, George W. ..... Minneapolis
Hauser, Harris M. ..... Rochester
Hauser, Victor P. ..... St. Paul
Havel, Robert J. ..... Minneapolis
Haven, Walter K. ..... Minneapolis
† Havens, Fred Z. ..... Riverside, Calif.
† Havens, John G. W. ..... Austin
Hawk, Dale J. ..... St. Charles
Hawkinson, Raymond P. ..... Minneapolis
Hawley, George M. B., II ..... Red Wing
Hay, Lyle J. ..... Minneapolis
Hayes, Albert F. ..... St. Paul
† Hayes, James M. ..... San Diego, Calif.
Hayles, Alvin B. ..... Rochester
Hays, Albert T. ..... Minneapolis
† Haywa, Eugene W. ..... Minneapolis
Head, Douglas P. ..... Minneapolis
† Healy, Raymond T. ..... Pierz
Hebbel, Robert ..... Minneapolis
† Hebeisen, Milton B. ..... Carver
Heck, Frank J. ..... Rochester
Heck, William W. ..... St. Paul
Hedemark, Homer H. ..... Ortonville
Hedemark, Truman A. ..... Ortonville
Hedenstrom, Frank G. ..... St. Paul
† Hedenstrom, Paul H. ..... White Bear Lake
Hedenstrom, Philip C. ..... Marshall
Hedlund, Charles J. ..... St. Paul
Hedrick, William L. ..... Minneapolis
Heegaard, William G. ..... Alexandria
† Hegge, Olav H. ..... Austin
Heiam, William C. ..... Cook
† Heiberg, Emmett A. ..... Fergus Falls
Heiberg, Olaf M. ..... Worthington
Heid, James K. ..... Little Falls
Heilig, William R. ..... St. Paul
Heilman, Fordyce R. ..... Rochester
Heimark, John J. ..... Mankato
Heimark, Julius J. ..... Fairmont
Heinz, Ivy B. ..... Shakopee
‡ Heinz, John N. ..... Ft. Clayton, Canal Zone
Heinzerling, Carl R. ..... Chaska
Heise, Carl vR. ..... Winona
Heise, Herbert vR. ..... Winona
Heise, Paul vR. ..... Winona
Heise, Philip vR. ..... Winona
Heise, William vR. ..... Winona
Heller, Edgar E. ..... Mankato
† Helm, Walter J. ..... Rochester
Helseth, Hovald K. ..... Fergus Falls
Helwig, Karl L., Jr. ..... Kerkhoven
Hempel, Dean J. ..... Minneapolis
Henderson, Arthur J. G. ..... North St. Paul
Henderson, Edward D. ..... Rochester
Henderson, John W. ..... Rochester
Henderson, Lowell L. ..... Rochester
Hendricks, Esten J. ..... Verndale
† Hendrickson, John F. ..... Minneapolis
Hengstler, William H. ..... St. Paul
Henrikson, Earl C. ..... Minneapolis
Henry, Clarence J. ..... Milaca
† Henry, Clifford E. ..... Kirksville, Mo.
Henry, Harold W. ..... Hinckley
Henry, Joseph E. ..... Milaca
Henry, Kenneth G. ..... Owatonna
Hepper, Norman G. ..... Rochester
Herber, Leo ..... Thief River Falls
Herbert, Willis L. ..... Minneapolis
Herman, Samuel M. ..... St. Paul
Hermann, Harold W. ..... Minneapolis
Hermanson, Peter E. ..... Hendricks
* Herrmann, Edgar T. ..... St. Paul
† Hertel, Garfield E. ..... Austin
Hertz, Myron J. ..... St. Paul
Helsa, Inman A. ..... Austin
† Hewitt, Edith S. ..... Rochester
† Hewitt, Richard M. ..... Rochester
Higgins, John A. ..... Rochester
Hildebrand, John E. ..... Bemidji
Hildebrandt, Walter C. ..... Minneapolis
Hilding, Anderson C. ..... Duluth
Hilger, Jerome A. ..... St. Paul
Hilger, Laurence D. ..... St. Paul
Hilgermann, George O. ..... Minneapolis
Hilker, Marcus D. ..... St. Paul
Hill, Earl ..... Minneapolis
Hill, Elmer M. ..... St. Paul
† Hill, Frederick E. ..... Riverside, Calif.
Hill, John R. ..... Rochester
Hill, Richard W. ..... Rochester
† Hillis, Samuel J. ..... East Bradenton, Fla.
Hinckley, Robert G. ..... Minneapolis
Hinderaker, Harris P. ..... Willmar
Hines, Edgar A., Jr. ..... Rochester
Hiniker, Louis P. ..... St. Paul
Hiniker, Peter J. ..... Le Sueur
Hinz, Walter E. ..... Willmar
† Hirschboeck, Frank J. ..... Duluth
Hirsh, Stanton A. ..... Crookston
Hitchcock, Claude R. ..... Minneapolis
† Hitselberger, William E. ..... Rochester
Ho, Shu Kang ..... St. Paul
Hochfilzer, John J. ..... St. Paul
† Hodapp, Robert V. ..... Minneapolis
Hodges, Kenneth V. ..... Minneapolis
Hodgson, Corrin H. ..... Rochester
Hodgson, Jane E. ..... St. Paul
Hodgson, John R. ..... Rochester
Hoeg, Dwight C. ..... Duluth
Hoeper, Philip G. ..... Mankato
Hoff, Herbert O. ..... Duluth
Hoffbauer, Frederick W. ..... Minneapolis
Hoffert, Henry E. ..... Minneapolis
Hoffman, David L. ..... Rochester
Hoffman, Roy A. ..... Minneapolis
Hoffman, Walter L. ..... Minneapolis
Hofmann, Gerald N. ..... Minneapolis
Hoganson, Donald E. ..... Bemidji
† Hoidale, Andrew D. ..... Tracy
† Holbrook, Margaret A. ..... Rochester
† Holcomb, Joel T. ..... Marine-on-St. Croix
† Holcomb, O. William ..... St. Paul
Holian, Darwin K. ..... Albert Lea
Holland, C. R. ..... Rochester
Hollenhorst, Robert W. ..... Rochester
† Holley, Keith E. ..... Rochester
Hollinshead, W. H. ..... St. Paul
Holm, Donald F. ..... Benson
Holman, Colin B. ..... Rochester
Holmberg, Conrad J. ..... Minneapolis
† Holmberg, LeRoy J. ..... Canby
Holmen, Robert W. ..... St. Paul
Holmes, Alva E. ..... Rush City
Holmstrom, Carle H. ..... Warren
† Holsinger, Donald R. ..... Rochester
Holt, John E. ..... St. Paul
Holten, John ..... Moorhead
Holzapfel, Fred C. ..... Minneapolis
Hom, Leong Y. W. ..... Battle Lake
Honath, Donald H. ..... Owatonna
† Honet, Joseph C. ..... Rochester
Hoover, Norman W. ..... Rochester
† Hopkins, Donald M. ..... Rochester
Hopkins, George W. ..... St. Paul
† Hopkins, James W. ..... Rochester
Hopperstad, J. Jerome ..... Minneapolis
Hoppes, Emerson E. ..... Minneapolis
Horns, Howard L. ..... Minneapolis
Horns, Richard C. ..... Minneapolis
† Horton, Bayard T. ..... Rochester
Hoseth, Wayne L. ..... Minneapolis
Hottinger, Raymond C. ..... Janesville
Houglum, Arvid J. ..... Lake Park
Houkom, Bjarne ..... Minneapolis
Houkom, Samuel S. ..... Duluth
Houle, Rollin J. ..... New Brighton
Houlton, William H. ..... St. Paul
Houts, Joseph C. ..... Dassel
Hovde, Gordon W. ..... Chisago City
Hovde, Rolf ..... Winthrop
Hovland, Melvin L. ..... Minneapolis
Howard, Eric G. ..... Spring Valley
Howard, Frank M., Jr. ..... Rochester
Howard, Marshall I. ..... Mankato
Howard, Merrill A. ..... St. Paul
Howard, Robert B. ..... Minneapolis
Howard, Solomon E. ..... Minneapolis
Howe, Newell W. ..... South St. Paul
Howell, Carter W. ..... Minneapolis
Howell, Llewelyn P. ..... Rochester
Howell, Milton M. ..... Glencoe
Hoyer, Ludolf J. ..... Windom
Hoyt, C. Sherman ..... Minneapolis
Hruza, William J. ..... Madelia
Huber, Robert W. ..... St. Croix Falls, Wis.
Hubin, Edwin G. ..... Sandstone
Hudec, Elwyn R. ..... Echo
† Hudson, George E. ..... Minneapolis
Huebert, Dan W. ..... Hutchinson
† Huenekens, Edgar J. ..... Wayzata
‡ Huff, James F. ..... Alexandria, La.
† Huffington, Herbert L. ..... Lutsen
Huffington, Herb L., Jr. ..... Waterville
Hughes, Bernard J. ..... Brainerd
Hughes, Sidney O. ..... Winona
Huizenga, Kenneth A. ..... Rochester
Hullsiek, Harold E. ..... St. Paul
Hulteng, Donald B. ..... Minneapolis
Hultkrans, Rudolph E. ..... Minneapolis
Humphrey, Edward W. ..... Moorhead
Hunt, Arthur B. ..... Rochester
Hunt, James Calvin ..... Rochester
Hunt, James Cleon ..... Rochester
† Hunt, Roscoe C. ..... Fairmont
Hunt, William ..... Fergus Falls
Hunter, James S. ..... Rochester
Hunter, Murray H. ..... Farmington
Hunter, Samuel W. ..... St. Paul
Hurr, Maland C. ..... Minneapolis
Hurwitz, Milton M. ..... St. Paul
Husebye, Kjeld O. ..... St. Paul
† Hustad, Edward G. ..... Minneapolis
Hutchinson, Dorothy W. ..... Oak Terrace
Hutchinson, Henry ..... Moose Lake
† Huxley, Fredrick R. ..... Faribault
Hymes, Charles ..... Minneapolis
*†Hynes, John E. ..... Minneapolis

† Ide, Arthur W. ..... Clearwater, Fla.
Ide, Arthur W., Jr. ..... Minneapolis
Idstrom, Linneous G. ..... Minneapolis
Ikeda, Kano ..... St. Paul
† Iliescu, John, Jr. ..... Rochester
Indeck, Walter ..... Minneapolis

Ingalls, Edgar G. ..... Minneapolis
Inglis, William ..... Redwood Falls
‡ Inlow, Robert P. ..... Columbia, S. C.
Ireland, Gerald W. ..... Grand Rapids
† Irvine, Harry G. ..... Minneapolis
Ivers, Robert R. ..... Rochester
Iverson, Eleanor B. ..... Minneapolis
Iverson, Rolf M. ..... Minneapolis
Ivins, John C. ..... Rochester
Ivy, Horace K. ..... Rochester

Jackman, Raymond J. ..... Rochester
Jackson, J. Albert ..... Minneapolis
Jackson, Richard L. ..... Minneapolis
Jackson, William C. ..... St. Paul
Jacobs, Douglas L. ..... Willmar
† Jacobs, Johannes C. ..... Willmar
Jacobson, Clarence ..... Chisholm
Jacobson, Clifford W. ..... Breckenridge
Jacbson, Ferdinand C. ..... Duluth
Jacobson, Loren J. ..... Rochester
Jacobson, Wyman E. ..... St. Louis Park
Jaffe, Manuel O. ..... Rochester
James, Ellery M. ..... St. Paul
James, John W. ..... Mahtomedi
Janda, George W., Jr. ..... Minneapolis
Janecky, Allen G. ..... Baudette
Janes, Joseph M. ..... Rochester
Janssen, Martin E. ..... St. Paul
† Jarvis, Bruce W. ..... St. Paul
Jarvis, Charles W. ..... St. Paul
Jarvis, Marilyn A. ..... St. Paul
Jastram, Rupert M. ..... St. Paul
Jay, Alan R. ..... Minneapolis
Jedrzejewski, Walter Jay ..... Minneapolis
Jefferies, William L. ..... Minneapolis
Jensen, Alvin M. ..... Brownton
Jensen, Harry C. ..... Minneapolis
Jensen, John A. ..... Crookston
† Jensen, Marius J. ..... Minneapolis
Jensen, Nathan K. ..... Minneapolis
Jensen, Reynold A. ..... Minneapolis
† Jensen, Thorvold J. ..... Duluth
Jenson, James E. ..... Stillwater
Jepson, William W. ..... Minneapolis
Jerome, Bourne ..... Minneapolis
Jerome, Elizabeth B. ..... Minneapolis
Jeronimus, Henry J. ..... Duluth
Jessico, Charles M. ..... Duluth
Jeub, Robert P. ..... Minneapolis
Joffe, Harold H. ..... Virginia
Johanson, Waldemar G. ..... St. Paul
‡ John, Robert H. ..... St. Paul
Johnson, Aldridge F. ..... Isle
Johnson, Angelo G. ..... Minneapolis
Johnson, Arthur B. ..... Minneapolis
Johnson, Calvin J. ..... Grand Rapids
Johnson, Carl Edwin ..... St. Paul
Johnson, Carl Eric ..... Rochester
Johnson, Carolyn A. ..... St. Paul
Johnson, C. Percy ..... Tyler
Johnson, Curtis M. ..... Winona
Johnson, David R. ..... Minneapolis
Johnson, Douglas L. ..... Little Falls
Johnson, Edward A. ..... Minneapolis
† Johnson, Einer W. ..... Bemidji
Johnson, Einer W., Jr. ..... Rochester
Johnson, Emil W. ..... Minneapolis
Johnson, Frank E. ..... Minneapolis
Johnson, Harry A. ..... Minneapolis
Johnson, Herbert W. ..... St. Paul
† Johnson, James A. ..... Minneapolis
Johnson, John W. ..... Minneapolis
Johnson, Karl E. ..... Duluth
† Johnson, Leonard M. ..... Rochester
Johnson, Malcolm R. ..... Minneapolis
Johnson, Marvin W. ..... Dassel
Johnson, Morris B. ..... St. Paul
Johnson, Norman P. ..... Minneapolis
Johnson, Norman Paul ..... Minneapolis
Johnson, Norton T. ..... Minneapolis
Johnson, O. Guy ..... Bayport
Johnson, Olga H. ..... Moorhead
Johnson, Orville H. ..... Edina
Johnson, Paul E. ..... Minneapolis
† Johnson, Ralph A. ..... Rochester
Johnson, Ralph B. ..... Lanesboro
Johnson, Ray A. ..... Fergus Falls
Johnson, Reinald G. ..... Minneapolis
Johnson, Reuben A. ..... Minneapolis
Johnson, Richard J. ..... St. Paul
Johnson, Richard S. ..... Minneapolis
Johnson, Robert E. ..... Minneapolis
Johnson, Robert H. ..... Bayport
Johnson, Roger S. ..... Wayzata
Johnson, Victor ..... Rochester
Johnson, Vilhelm M. ..... Dawson
Johnson, William E. ..... Morgan
Johnson, Youbert T. ..... Minneapolis
Johnsrud, Luverne W. ..... Hibbing
Johnston, Henry W. ..... Virginia
Johnston, Leonard F. ..... Winona
Jolin, Francis M. ..... Remer
Jones, David G. ..... Minneapolis
† Jones, E. Mendelssohn ..... St. Paul
† Jones, Herbert W., Jr. ..... Minneapolis
Jones, Orville H. ..... Mankato
Jones, Richard H. ..... Minneapolis
† Jones, Richard N. ..... St. Cloud
Jordan, Donald V. ..... Minneapolis
† Jordan, Kathleen B. ..... Granite Falls
Jordan, Lewis S. ..... Granite Falls
Jorgenson, Edward O. ..... Duluth
Joseph, Arnold H. ..... St. Paul
* Josewich, Alexander ..... Minneapolis
Josewski, Raymond J. ..... Stillwater
Joyce, George L. ..... Rochester
† Joyce, John W. ..... Rochester
Judd, Allen S. ..... Minneapolis
Judd, Edward S. ..... Rochester
Judd, Walter H. ..... Washington, D. C.
Juergens, Herman M. ..... Belle Plaine
Juergens, John L. ..... Rochester
Juergens, Manley F. ..... Stillwater
Juers, Edward H. ..... Red Wing
† Juliar, Richard O. ..... Los Angeles, Calif.
Juntunen, Roy R. ..... Duluth
Jurdy, Mitchell J. ..... Minneapolis
Just, Herman J. ..... Hastings

† Kaasa, Lawrence J. ..... Albert Lea
† Kabrick, Ola A. ..... St. Peter
Kadesky, Harold B. ..... Minneapolis
Kaiser, Milton L. ..... New Ulm
Kalin, Oscar T. ..... Minneapolis
Kallestad, Leonard L. ..... Wayzata
Kamman, Gordon R. ..... St. Paul
Kanne, Earl R. ..... Brainerd
Kaplan, David H. ..... St. Paul
Kaplan, Harold A. ..... Minneapolis
Kaplan, J. J. ..... Minneapolis
Kapsner, Alfred T. ..... Princeton
Karges, Laurel E. ..... Grand Rapids
Karish, Louis J. ..... Coleraine
Karleen, Bernard N. ..... Jackson
Karleen, Conrad I. ..... Minneapolis
Karlen, Markle ..... Minneapolis
Karn, Jacob F. ..... Ortonville
Karon, Everett H. ..... St. Paul
Karon, Irvine M. ..... St. Paul
Kasper, Eugene M. ..... St. Paul
Kasper, Robert E. ..... Minneapolis
Kath, Reinhard H. ..... Arlington
Katz, Louis J. ..... Long Beach, Calif.
Kaufman, Edward J. ..... Appleton
Kaufman, Herschel J. ..... Minneapolis
Kaufman, Walter B. ..... Mankato
Kaufman, William C. ..... Appleton
Kearney, Rochfort W. ..... Mankato
Kearns, Thomas P. ..... Rochester
Keating, Francis R., Jr. ..... Rochester
† Keck, Stanley W. ..... Rochester
Keefe, Rolland E. ..... St. Paul
Keefe, William P. ..... Rochester
Keil, Marcus A. ..... Albert Lea
Keith, Haddow M. ..... Rochester
† Keith, Norman M. ..... Rochester
Keith, Paul J. ..... Milaca
Keithahn, Elmer E. ..... Sleepy Eye
Kelby, Gjert M. ..... Minneapolis
Kelley, Roger E. ..... Crosby
† Kelley, Walter M. ..... Madison, Wis.
Kelly, Albert C. ..... St. Paul
Kelly, Charles F. ..... Minneapolis
Kelly, Edward H. ..... St. Paul
Kelly, James H. ..... St. Cloud
Kelly, John F. ..... Cold Spring
Kelly, John P. ..... Minneapolis
Kelly, John T. ..... Minneapolis
Kelly, Patrick J. ..... Rochester
Kelly, Robert T. ..... Grand Rapids
† Kelsey, Carleton G. ..... St. Paul
Kelsey, Chauncey M. ..... St. Paul
† Kemp, Alphonse F. ..... Mankato
Kenefick, Emmett V. ..... St. Paul
Kennedy, Byrl J. ..... Minneapolis
† Kennedy, Claude C. ..... Minneapolis
Kennedy, George L. ..... Faribault
† Kennedy, Jane F. ..... Minneapolis
Kennedy, Roger L. J. ..... Rochester
Kenyon, Thomas J. ..... St. Paul
Kerkhof, Arthur C. ..... Minneapolis
Kernohan, James W. ..... Rochester
† Kesting, Herman ..... St. Paul
Kevern, Jay L. ..... Henning
Keyes, John D. ..... Winona
Keyes, Robert W. ..... Pipestone
Kiely, Joseph M. ..... Rochester
Kierland, Robert R. ..... Rochester
Kiesler, Frank, Jr. ..... Minneapolis
Kilbride, Edwin A. ..... Worthington
Kim, Mark Kibang ..... Minneapolis
† Kim, Robert ..... Rochester
Kimmel, George C., Jr. ..... Minneapolis
Kincaid, Owings W. ..... Rochester
King, Frances, Willard ..... Oak Terrace
† King, George L. ..... Hudson, Wis.
Kinkade, Byron R. ..... Ada
Kinsella, Thomas J. ..... Minneapolis
Kinzel, Raymond C. ..... Rochester
Kiolbasa, Edward B. ..... Stillwater
Kippen, Neil ..... Breckenridge
Kirby, Thomas J., Jr. ..... Rochester
Kirklin, John W. ..... Rochester
‡ Kirshen, Robert ..... Chicago, Ill.
Kitzberger, Peter J. ..... New Ulm
Kjenaas, Ervin A. ..... Hastings
Klass, Donald W. ..... St. Paul
Klefstad, Lloyd H. ..... Greenbush
† Klein, Harry ..... Duluth
Klein, William A. ..... Duluth
Kline, Richard F. ..... St. Cloud
Knapp, Frank N. ..... Duluth
Knapp, Miland E. ..... Minneapolis
† Knight, Ralph T. ..... Minneapolis
† Knight, Ray R. ..... Minneapolis
Knoedler, John P. ..... Duluth
Knoll, W. V. ..... Brainerd
Knudsen, Helen L. ..... Minneapolis
Knutson, Gerhard E. ..... St. Paul
† Knutson, Kenneth R. ..... Minneapolis
Knutson, Lewis A. ..... Spring Grove
Knutson, Robert C. ..... St. Paul
Kodres, Nina ..... St. Paul
Koelsche, Giles A. ..... Rochester
Koenecke, F. H. ..... Lakefield
Koenig, Robert P. ..... St. Cloud
† Koenigsberger, Charles ..... Mankato
Koepcke, Gerald M. ..... Minneapolis
Kogl, Richard C. ..... Edina
Kohlbry, Carl O. ..... Duluth
Kohlhase, Robert E. ..... Minneapolis
† Kohn, Eleanor M. ..... Rochester
Kolars, James J. ..... Faribault
† Koller, Hermann M. ..... Minneapolis
† Koller, Louis R. ..... Minneapolis
Koller, Robert L. ..... Hopkins
Kolp, Berton A. ..... Glenwood
Kooda, Jennings C. ..... Morris
Koons, W. R. ..... Mahnomen
Koop, Severin H., Jr. ..... St. Cloud
Korchik, John P. ..... Minneapolis
Korda, Henry A. ..... Pelican Rapids
Kosiak, John, Jr. ..... Minneapolis
Kosiak, William ..... Two Harbors
Kostick, William Robert ..... Fertile
Kotchevar, Frank R. ..... Eveleth
Kottke, Frederic J. ..... Minneapolis
Kotval, Russell J. ..... Pipestone
Koucky, Rudolph W. ..... Minneapolis
Kovack, Freeman D. ..... Minneapolis
Kozak, Michael J. ..... Minneapolis
Koza, Donald W. ..... St. Paul
Kozberg, Oscar ..... Moose Lake
† Krabill, Donald R. ..... Rochester
Kraemer, George N. ..... Fairmont
Krafchuk, John D. ..... Minneapolis
Krafft, Walter E. ..... Minneapolis
Kragh, Lyle V. ..... Minneapolis
Krause, Carl W. ..... Fairmont
Kremen, Arnold J. ..... Minneapolis
Kretschmar, Paul O. ..... Rochester
Kreuzer, Titus C. ..... Marshall
Krezowski, Thomas K. ..... St. Paul
Krieser, Albert E. ..... Minneapolis
Krueger, Victor R. ..... Nopeming
Kruger, Elmer L., Jr. ..... Nashwauk
Krusan, Frank H. ..... Rochester
Kruzich, Stephen J. ..... Sleepy Eye
Krystosek, Lee A. ..... Minneapolis
Kucera, Frank J. ..... Hopkins
Kucera, Stanley T. ..... Northfield
† Kucera, William J. ..... Santa Barbara, Calif.
Kugler, Alex A. ..... St. Paul
Kuhlmann, Lawrence B. ..... Melrose
Kulstad, Oscar S. ..... Dodge Center
Kulzer, Norbert J. ..... Hastings
Kump, Warren L. ..... Minneapolis
Kundel, Robert R. ..... Ely
Kuske, Albert W. ..... St. Paul
† Kusske, Arthur L. ..... New Ulm
Kusske, Bradley W. ..... St. Paul
Kusske, Douglas R. ..... St. Paul
Kusz, Clarence V. ..... Minneapolis
Kvale, Walter F. ..... Rochester
Kyle, Robert A. ..... Boston, Mass.

LaBree, John W. ..... St. Louis Park
LaBree, Robert H. ..... Duluth
LaFond, Edward M. ..... St. Cloud
Lagaard, Sheldon M. ..... Minneapolis
Laikola, Leslie A. ..... Adrian
† Laird, Arthur T. ..... Duluth
† Lajoie, John M. ..... Minneapolis
Lake, Clifford F. ..... Rochester
Lamb, H. Douglas ..... Minneapolis
Lang, Leonard A. ..... Minneapolis
Lannin, Bernard G. ..... St. Paul
Lannin, Donald R. ..... St. Paul
‡ Lansche, Richard K. ..... New York, N. Y.
† Lapierre, Arthur P. ..... Minneapolis
Larrabee, Walter F., Jr. ..... St. Paul

Larsen, Frank Wm. ..... Minneapolis
Larson, Arnold ..... Detroit Lakes
Larson, Arthur K. ..... Minneapolis
Larson, Arthur N. ..... Fergus Falls
Larson, Clarence M. ..... Minneapolis
Larson, Donald M. ..... Minneapolis
Larson, Dorette W. ..... Moose Lake
Larson, Eva Jane O. ..... St. Paul
Larson, Gerald E. ..... Cambridge
Larson, James T. ..... South St. Paul
Larson, Keith D. ..... Moose Lake
Larson, Kenneth R. ..... St. Paul
Larson, Lawrence M. ..... Minneapolis
Larson, Leonard M. ..... Oak Terrace
Larson, Leroy James ..... Bagley
Larson, Loren J. ..... Minneapolis
Larson, Martin L. ..... St. Paul
Larson, Milo H. ..... St. Peter
Larson, Norman E. ..... Rochester
Larson, Oliver E. H. ..... Zumbrota
Larson, Paul N. ..... Minneapolis
† Larson, Richard E. ..... Rochester
Larson, Roger C. ..... Minneapolis
Larson, Wyllis G. ..... St. Paul
Laszewski, Franz von Zelberschwecht .... St. Paul
Latterell, Kenneth E. ..... Duluth
Latts, Elliot M. ..... Minneapolis
† Lauvstad, Walter A. ..... Rochester
† LaVake, Rae T. ..... Minneapolis
Law, Harrison E. ..... Virginia
Lawson, Warren R. ..... Minneapolis
Lawton, James J., Jr. ..... St. Paul
Laymon, Carl W. ..... Minneapolis
Lazarte, Jorge A. ..... Rochester
† Leahy, Bartholomew ..... St. Paul
Leavenworth, Richard O., Jr. ..... St. Louis Park
Leck, Paul C. ..... Austin
Lee, Gordon E. ..... Glenwood
Lee, Hubert W. ..... Brainerd
† Lee, John W. ..... Rochester
† Lee, Ling Hong ..... Rochester
Lee, Norman J. ..... Tracy
Lee, Robert E. ..... Rochester
Leek, Joseph H. ..... Duluth
Leemhuis, Andrew J. ..... Minneapolis
† Lehrman, Arthur ..... Rochester
Lehrer, Alfred J., Jr. ..... Montgomery
† Leibold, Herbert H. ..... Parkers Prairie
Leick, Richard M. ..... St. Paul
Leiferman, Robert J. ..... Minneapolis
‡ Leigh, John E. ..... Rochester
Leinonen, Wendla E. ..... Anoka
Leitch, Archibald ..... St. Paul
Leland, Harold R. ..... Minneapolis
Lenander, Mellvin E. L. ..... St. Peter
Lenarz, Albert J. ..... St. Cloud
Lende, Norman ..... Faribault
Lenz, Joseph R. ..... Morton
Lenz, O. A. ..... Minneapolis
Leonard, J. Paul ..... St. Cloud
Leonard, Lawrence J. ..... Minneapolis
Leonard, Samuel ..... Minneapolis
† Leopard, Brand A. ..... Brownsville, Texas
† Lepak, Francis J. ..... Duluth
Lepak, John A. ..... St. Paul
Leppo, N. Erkki A. ..... Duluth
† Lerche, William ..... Cable, Wis.
Lerner, A. Ross ..... Minneapolis
L'esperance, Bernard F. ..... Two Harbors
Lessard, Richard J. ..... St. Paul
Lester, Malcolm J., Jr. ..... Truman
Lester, Richard G. ..... Minneapolis
Letson, Robert D. ..... Glenwood
Leven, Nathaniel L. ..... St. Paul
Leverenz, Carleton W. ..... St. Paul
† Levis, Michael P. ..... Rochester
Levitt, George X. ..... St. Paul
Lewallen, Gene S. ..... Mora
Lewis, Charles W. ..... Henning
Lewis, Joyce S., Jr. ..... St. Paul
Lick, Charles L. ..... St. Paul
Lick, Louis C. ..... St. Paul
Lick, William J. ..... St. Paul
† Lidsky, Martin D. ..... Rochester
† Liebesman, William P. ..... Rochester
† Liedloff, Adolph G. ..... Mankato
Lien, Richard J. ..... St. Paul
Lienke, Roger I. ..... Robbinsdale
Liffrig, William W. ..... Red Wing
† Lightbourn, Edgar L. ..... Hastings
Lilleberg, Norbert J. ..... St. Paul
Lillehei, C. Walton ..... Minneapolis
Lillehei, Elmer J. ..... Robbinsdale
Lillie, John C. ..... Rochester
Lima, Ludvig R. ..... Montevideo
Limbeck, Donald A. ..... Le Sueur
Lindahl, Merlyn J. ..... Sherburn
Lindberg, Alfred L. ..... Wheaton
Lindberg, Arthur N. ..... Minneapolis
*† Lindberg, Arvid C. ..... Minneapolis
Lindberg, Vernon L. ..... Minneapolis
Lindberg, W. R. ..... Minneapolis
Lindblom, Alton E. ..... North Mankato
Lindblom, Maurice L. ..... Minneapolis
Lindell, Robert ..... St. Paul
Lindeman, Raymond J. ..... Paynesville
Lindemann, Charles E. ..... Minneapolis
Linderholm, Bruce E. ..... Minneapolis
Lindgren, Russell C. ..... Minneapolis
Lindley, Stanley B. ..... St. Cloud
Lindquist, Richard H. ..... Minneapolis
Linke, Charles A. ..... Duluth
Linke, Clara L. ..... Duluth
Linnell, Leonard ..... St. Peter
Linner, Gunnar ..... Minneapolis
† Linner, Henry P. ..... Minneapolis
Linner, John H. ..... Minneapolis
Linner, Paul W. ..... Minneapolis
* Lippman, Emanuel S. ..... Minneapolis
Lippman, Hyman S. ..... St. Paul
Lippmann, Elmer W. ..... Hutchinson
Lipschultz, Oscar ..... Minneapolis
Lipscomb, Paul R. ..... Rochester
Lipson, Richard Lewis ..... Rochester
† Litchfield, John T. ..... Minneapolis
Litin, Edward M. ..... Rochester
Litkewitsch, Helene ..... St. Paul
Litman, Abraham B. ..... Minneapolis
Litman, Samuel N. ..... Duluth
Litzow, Thaddeus J. ..... Rochester
Lober, Paul Hallam ..... Minneapolis
Loes, Louis A. ..... St. Cloud
Lofgren, Karl A. ..... Rochester
Lofsness, Stanley V. ..... St. Paul
‡ Lofstrom, Dennis E. ..... Tanganyika, East Africa
Logan, George B. ..... Rochester
† Logefeil, Rudolph C. ..... Minneapolis
Logothetis, John A. ..... Minneapolis
Lohmann, John G. ..... Pipestone
Loken, Selmer M. ..... St. Paul
Loken, Theodore ..... Ada
Lommen, Peter A. ..... Austin
Lommen, Peter A., Jr. ..... Austin
Longfellow, Helen W. ..... Brainerd
† Loomis, Earl A. ..... Minneapolis
Loomis, George L. ..... Winona
Lorenc, Ernest ..... Rochester
Lorentzen, Ernest S. ..... Detroit Lakes
Lott, Frederick H. ..... Minneapolis
Louisell, Charles T. ..... Fairmont
Love, Frederick A. ..... Carlos
Love, J. Grafton ..... Rochester
Lovett, Beatrice R. ..... Wayzata
Lowe, Alexander D. ..... So. St. Paul
Lowe, Earl R. ..... So. St. Paul
Lowe, Thomas A. ..... So. St. Paul
Lowry, Elizabeth C. ..... Minneapolis
Lowry, Paul T. ..... Minneapolis
Lowry, Thomas ..... Minneapolis
Lu, Cheng-En ..... Fergus Falls
† Luck, Hilda ..... Mankato
Lueck, Wallace W. ..... Minneapolis
Lufkin, Nathaniel H. ..... Minneapolis
Lukk, Olaf ..... Montgomery
Lund, Carl J. ..... Fergus Falls
Lund, George W. ..... Minneapolis
Lund, J. Benjamin ..... Mankato
Lund, Werner J. ..... Staples
Lundberg, Ruth I. ..... Minneapolis
Lundblad, Roy A. ..... Minneapolis
Lundblad, Stanley W. ..... Minneapolis
Lundeberg, Karl R. ..... Minneapolis
Lundell, Carl L. ..... Granite Falls
Lundholm, Arthur M. ..... Harris
Lundquist, Curt W. ..... Owatonna
Lundquist, Virgil J. ..... Minneapolis
Lundsten, Leslie C. ..... Bemidji
Lynch, Francis W. ..... St. Paul
† Lynch, Matthew J. ..... Minneapolis
Lynde, Orrin G. ..... Los Gatos, Calif.
† Lyne, Benjamin W. ..... Rochester
Lyon, John D., Jr. ..... Hopkins
Lyons, James H. ..... Minneapolis
Lyons, Michael W. ..... Minneapolis
† Lysne, Henry ..... Minneapolis
Lysne, Myron ..... Robbinsdale
† Lysyj, Anatol ..... Minneapolis
Lyzenga, Anton G. ..... Minneapolis

McBean, James B. ..... Rochester
* McCabe, James S. ..... St. Paul
McCaffrey, Fabian J. ..... Wayzata
McCain, Donovan L. ..... St. Paul
McCampbell, Malcom D. ..... Minneapolis
McCannel, Malcom A. ..... Minneapolis
McCarten, Francis M. ..... Stillwater
McCarthy, Austin M. ..... Willmar
McCarthy, Donald ..... Fort Snelling
* McCarthy, Joseph J. ..... St. Paul
*† McClanahan, James H. .... White Bear Lake
McClanahan, Thomas S. .... Whtie Bear Lake
McClellan, Robert J. ..... St. Paul
McCloud, C. Naumann, Jr. ..... St. Paul
McConahey, William M., Jr. ..... Rochester
McCormick, Donald P. ..... Minneapolis
† McCormick, Patrick J. ..... Rochester
McCoy, Donald E. ..... Glencoe
*† McCoy, Mary K. ..... Duluth
† McDaniel, Orianna ..... Minneapolis
McDaniel, Samuel P. ..... Lakeville
† McDonald, Archibald L. ..... Duluth
McDonald, Colin C. ..... Rochester
McDonald, Owen G. ..... Duluth
† McDowell, John P. ..... St. Cloud
McEnaney, James E. ..... Owatonna
McEwan, Alexander ..... St. Paul
McFarland, Arthur H. ..... Minneapolis
McGandy, Robert F. ..... Minneapolis
McGeary, George E. ..... Minneapolis
McGill, Leon K. ..... Virginia
McGoon, Dwight C. ..... Rochester
McGroarty, Brian J. ..... St. Paul
McHaffie, Orval L. ..... Duluth
† McHenry, Martin ..... Rochester
McHutchison, Samuel K. ..... St. Charles
McIlhany, Mary Lou .... Albuquerqe, N. M.
McInerny, Maurice W. ..... Minneapolis
McIntyre, John A. ..... Owatonna
* McKaig, Carle B. ..... Pine Island
McKelvey, John L. ..... Minneapolis
† McKenna, Elizabeth M. ..... San Francisco, Calif.
McKenna, John J. ..... Virginia
† McKenna, J. K. ..... Austin
McKenna, Maurice J. ..... Grand Rapids
McKenzie, Charles H. ..... Minneapolis
McKenzie, Eva E. ..... St. Paul
† McKillop, Robert G. ..... Rochester
McKinlay, Chauncey A. ..... Minneapolis
McKinlay, Gordon L. ..... Minneapolis
† McKinney, Frank S. ..... Minneapolis
McLane, William O. ..... Brainerd
McLaughlin, Byron H. ..... Minneapolis
† McLaughlin, Edmund M. ..... Winona
McManus, William F. ..... Princeton
McMurtrie, William B. ..... Minneapolis
McNear, George R., Jr. ..... Mankato
McNeil, John J. ..... Minneapolis
McNeil, Maurice R. ..... Glencoe
McNeill, John A. ..... St. Paul
McNutt, John R. ..... Duluth
McParland, Felix A., Jr. ..... Minneapolis
McPheeters, Herman O. ..... Minneapolis
† McQuarrie, Irvine ..... Minneapolis
MacCarty, Collin S. ..... Rochester
† MacCarty, William C. ..... Rochester
MacCornack, Robert L., Jr. ..... St. Paul
† McDonald, Daniel A. ..... Minneapolis
MacDonald, John W. ..... Minneapolis
MacKinnon, Donald C. ..... Minneapolis
MacLean, Alexander R. ..... Rochester
MacLean, Lloyd D. ..... St. Paul
MacRae, Gordon C. ..... Duluth
Mach, Frank B. ..... Minneapolis
Mach, John R. ..... Minneapolis
Mach, Ralph F. ..... Pine City
Macheledt, Neil L. ..... Anoka
Macklin, William E., Jr. ..... Willmar
Mackoff, Samuel M. ..... Phoenix, Ariz.
Madland, Robert S. ..... St. Paul
Maeder, Edward C. ..... Minneapolis
Magath, Thomas B. ..... Rochester
† Magid, Gail A. ..... Rochester
Magney, Fredolph H. ..... Duluth
Magnuson, Allen E. ..... Wheaton
Magnuson, Raymond C. ..... Cambridge
Magraw, Richard M. ..... Minneapolis
Magee, Charles J. ..... Rochester
Maher, Frank T. ..... Rochester
Mahle, Donald G. ..... Plainview
Mahle, James P. ..... Minneapolis
Maitland, Edwin T. ..... Jackson
† Maland, Clarence O. ..... Minneapolis
Malerich, J. Anthony ..... So. St. Paul
Malerich, J. Anthony, Jr. ..... St. Paul
‡ Malkasian, George D., Jr. .... N. Chicago, Ill.
Malstrom, John A. ..... Virginia
Mandell, Sheldon L. ..... Minneapolis
Mankey, James C. ..... Minneapolis
Mankin, Harold T. ..... Rochester
Manlove, Charles H., Jr. ..... St. Paul
Mann, George A. ..... Minneapolis
† Manson, Frank M. ..... Worthington
MarCia, Alfred M. ..... Minneapolis
‡ Marguilis, Alexander R. ..... St. Louis Mo.
Marking, George H. ..... Minneapolis
Markovitz, Jack M. ..... Minneapolis
Marks, Roger W. ..... St. Paul
Marshall, Clark M. ..... Crosby
Marshall, Hiram W. ..... Rochester
Marso, John L. ..... Mankato
Marsovszky, Paul J. ..... Moorhead
Martens, Theodore G. ..... Rochester
Martin, Albert C. ..... Luverne
Martin, Doreen A. ..... Pepin, Wis.
Martin, Dwight L. ..... St. Paul
Martin, Frank E. ..... Minneapolis
Martin, George B. ..... Thief River Falls

Martin, George R. ..... Minneapolis
Martin, Gordon M. ..... Rochester
† Martin, John H. ..... Rochester
Martin, John T. ..... Rochester
Martin, Maurice J. ..... Rochester
*† Martin, Thomas P. ..... Minneapolis
Martin, Webster C. ..... Duluth
Martin, William B. ..... Duluth
Martin, William J. ..... Rochester
† Martineau, Joseph L. ..... St. Paul
Martinson, Carl J. ..... Wayzata
Martinson, Elmer J. ..... Wayzata
Marvin, Joseph E. ..... Brainerd
† Masson, Duncan M. ..... Rochester
† Masson, James C. ..... Rochester
Masson, James K. ..... Rochester
Mast, Fredric L. ..... Chisholm
Mateo, Guillermo ..... St. Paul
Mathews, Wallace E. ..... Mankato
Mathieson, Don R. ..... Rochester
Matthews, James H. ..... Minneapolis
Mattison, Percy A. ..... Winona
Mattson, Albert D. ..... St. James
Mattson, Hamlin A. ..... Minneapolis
Maunder, John B. ..... Minneapolis
Maus, Philip W. ..... Dawson
† Maxeiner, Stanley R. ..... Minneapolis
Maxeiner, Stanley R., Jr. ..... Minneapolis
May, Robert B. ..... Fergus Falls
Mayberg, Donald M. ..... Minneapolis
Mayberry, William E. ..... Boston, Mass.
Mayne, John G. ..... Rochester
Mayne, Roy M. ..... Nopeming
Mayo, Charles W. ..... Rochester
Maytum, W. James ..... Rochester
Mazzitello, William F. ..... St. Paul
† Mead, Charles H. ..... Duluth
Mears, Burtis J. ..... St. Paul
Medelman, John P. ..... St. Paul
Meinert, Albert E. ..... Winona
Meinert, John K. ..... Willmar
Melancon, Joseph F. ..... St. Paul
*† Melby, Benedik ..... Blooming Pairie
Meller, Maurice ..... Brainerd
Meller, Robert Louis ..... Minneapolis
† Melzer, George R. ..... White Bear Lake
† Mensheha, Nicholas ..... Minneapolis
Menefee, Edward C. ..... Albert Lea
Menold, William F. ..... St. Paul
Mercil, William F. ..... Crookston
Meredith, Donald C. ..... Mankato
Merkert, Charles E. ..... Minneapolis
Merkert, George L. ..... Minneapolis
Merner, Thomas B. ..... Minneapolis
† Merrick, Charlotte T. ..... St. Paul
Merrick, Robert L. ..... St. Paul
Merrill, Robert W. ..... Morris
Merritt, Wallace A. ..... Rochester
Messenheimer, Myron G. ..... Minneapolis
Metcalf, Norman B. ..... Princeton
† Metge, William R. ..... Rochester
† Meyer, Anthony A. ..... Minneapolis
Meyer, Alvin J. ..... Minneapolis
† Meyer, E. Lawrence ..... Minneapolis
Meyer, Frederick C. ..... Kenyon
Meyer, Paul F. ..... Faribault
Meyer, Robert J. ..... Bethany, Okla.
Meyer, Robert P. ..... Faribault
† Meyerding, Henry Wm. ..... Rochester
† Meyers, Vernon Wm. ..... Rochester
Michael, Joseph C. ..... Minneapolis
Michel, Henry H. ..... Minneapolis
Michels, Roger P. ..... Willmar
Michelson, Henry E. ..... Minneapolis
† Michener, William M. ..... Rochester
Michienzi, Leonard J. ..... St. Paul
† Michelsen, Emma F. ..... Minneapolis
Mickelson, John C. ..... Mankato
Midboe, Gilbert T. ..... Forest Lake
Middlebrook, John E. ..... Minneapolis
Midthune, Andreen S. ..... Lake Park
† Mielke, John E. ..... Rochester
Miettunen, John B. ..... Hibbing
Milhaupt, Emmett N. ..... St. Cloud
Miller, Albert G. ..... St. Paul
Miller, Archie W. ..... Rochester
Miller, Arden L. ..... Minneapolis
Miller, Fletcher A. ..... Minneapolis
Miller, Harold D. ..... Minneapolis
Miller, Harold E. ..... Minneapolis
Miller, Herman ..... Austin
Miller, Hugo E. ..... Minneapolis
Miller, John C. ..... Minneapolis
Miller, Roland D. ..... Rochester
Miller, Ross H. ..... Rochester
† Miller, Victor I. ..... Belmont, Calif.
Miller, William P. ..... Montevideo
Miller, William T. ..... W. St. Paul
Miller, Winston R. ..... Red Wing
Miller, Zondal R. ..... St. Paul
Millett, D. Keith ..... Minneapolis
Millikan, Clark H. ..... Rochester
Mills, John L. ..... Winnebago
Mills, Stephen D. ..... Rochester
Milnar, Frank J. ..... St. Paul
Milton, John S. ..... Minneapolis
Minder, J. G. ..... Mound
Minge, Raymond K. ..... Worthington
Minsky, Armen A. ..... Minneapolis
Mishek, Charles J. ..... St. Paul
Mitby, Irvin L. ..... Minneapolis
Mitchell, Berton D. ..... Minneapolis
Mitchell, Edward C. ..... Minneapolis
Mitchell, George S. ..... St. Paul
Mitchell, Mancel T. ..... Minneapolis
Mitchell, William C. ..... Louisville, Ky.
Mixer, Harry W. ..... Minneapolis
Moberg, Clarence W. ..... Detroit Lakes
Mochal, Milo A. ..... Thief River Falls
Moe, John H. ..... Minneapolis
Moe, Thomas ..... Moose Lake
Moe, W. Wyatt ..... St. Paul
Moehn, John T. ..... Minneapolis
Moehring, Henry G. ..... Duluth
Moen, Johannes K., Jr. ..... Minneapolis
† Moersch, Fred P. ..... Ft. Lauderdale, Fla.
Moersch, Herman J. ..... Rochester
Moertel, Charles G. ..... Rochester
Moga, John A. ..... St. Paul
Molander, Herbert A. ..... St. Paul
Molenaar, Robert E. ..... Cannon Falls
Moller, Jurgen ..... Farmington
Mollers, Theodore P. ..... Soudan
Molnar, George D. ..... Rochester
† Monahan, Elizabeth S. ..... Minneapolis
Monahan, Robert H. ..... St. Paul
† Monge, James J. ..... Rochester
Monserud, Nels O. ..... Cloquet
Monson, Einer M. ..... Minneapolis
Monson, Leonard J. ..... Canby
† Montgomery, Hamilton ..... Rochester
Mooney, Robert D. ..... St. Paul
Moore, Irvin H. ..... Minneapolis
Moorhead, Marie ..... Minneapolis
Moos, Daniel J. ..... Minneapolis
† Moquin, Marie A. ..... St. Paul
Moran, Leo J. ..... New Brighton
† Morehead, Dewey E. ..... Bodega Bay, Calif.
† Moren, J. Adelaide ..... White Bear Lake
Morgan, Hugh O. ..... Amboy
Mori, Hideo ..... Rochester
Moriarty, Berenice ..... St. Paul
Moriarty, Cecile R. ..... St. Paul
Mork, Arthur H. ..... Anoka
Mork, Frank E. ..... Anoka
Morlock, Carl G. ..... Rochester
Morrell, Frank ..... Minneapolis
Morrison, Charlotte J. ..... Minneapolis
Morrow, George W., Jr. ..... Rochester
Morsman, L. W. ..... Hibbing
† Mortenson, Nels G. ..... Minneapolis
† Mortenson, Howard O. ..... Menahga
Mosby, Maurice E. ..... Long Prairie
Moses, Royal R. ..... Kenyon
Moskowitz, Roland W. ..... Rochester
Mosser, Donn G. ..... Minneapolis
Moulton, Keith B. ..... St. James
Mouritsen, Glenn J. ..... Fergus Falls
Moyer, John B. ..... Duluth
Moyer, Leonard B. ..... Minneapolis
‡ Muchow, Gene C. ..... Unknown
Mueller, Donald R. ..... Bagley
Mueller, Rudolph B. ..... Richmond
Muesing, Wm. J. ..... New Ulm
Mulder, Donald W. ..... Rochester
Mulholland, William M. ..... Minneapolis
† Mullady, Thomas F., III ..... Rochester
Muller, A. Eugene ..... North St. Paul
Muller, John J. ..... Hibbing
Mulligan, Arthur M. ..... Brainerd
Mundahl, Harold R. ..... St. Paul
Munger, James E. ..... Duluth
Munson, Martin S. ..... Barnum
Murn, Thomas G. ..... St. Cloud
Murphy, Edmund P. ..... Minneapolis
Murphy, Frank P. ..... Rochester
Murphy, Jack T. ..... St. Paul
Murphy, Joseph E. ..... Marshall
Murray, Elisabeth M. ..... Minneapolis
Murray, Robert A. ..... Hibbing
Murray, Roger C. ..... St. Paul
Murtaugh, Robert J. ..... Wadena
Musachio, Nicholas F. ..... Foley
Muske, Marvin M. ..... Minneapolis
Mussey, Mary E. ..... Rochester
Musty, Nicholas J. ..... Minneapolis
Myers, Jay A. ..... Minneapolis
Myers, John W. ..... Canby
Myers, Thomas T. ..... Rochester
Myhre, James ..... Minneapolis
Myre, Clifford R. ..... Paynesville

Nagel, Harold D. ..... Minneapolis
Nagle, Duane W. ..... Fargo, N. D.
Nagobads, Visvaldis J. ..... Minneapolis
Nakamura, James Y. ..... Deer River
Nash, Eldore B. ..... Minneapolis
Nash, Leo A. ..... St. Paul
Naslund, Ames W. ..... Minneapolis
Nauth, Bernard S. ..... Minneapolis
Navratil, Donald R. ..... Glencoe
Neal, Joe M. ..... Minneapolis
Nealy, Donald E. ..... Adrian
Neary, Richard P. ..... Minneapolis
† Neault, Roger W. ..... Rochester
Neel, Harry B. ..... Albert Lea
Neff, Walter S. ..... Virginia
Nehring, Jesse Potter ..... Preston
Neibergs, Lidija ..... St. Paul
Neibergs, Pauls ..... St. Paul
Neils, Vernon E. ..... Sauk Rapids
‡ Nielson, Andrew A. ..... New York, N. Y.
Nelimark, Donald R. ..... Virginia
† Nelson, Bernice A. ..... Minneapolis
† Nelson, Burnette G. ..... Hoyt Lakes
Nelson, C. Barton ..... Minneapolis
Nelson, Carleton A. ..... Minneapolis
Nelson, Charles H. ..... Albert Lea
Nelson, Clayton E. ..... Albert Lea
Nelson, Edward N. ..... Minneapolis
† Nelson, Erland R. ..... Minneapolis
Nelson, Ernest J. ..... Lonsdale
Nelson, Frank F. ..... New Ulm
Nelson, George E. ..... Minneapolis
Nelson, Glenn E. ..... Fairfax
Nelson, Gunard A. ..... Minneapolis
Nelson, Harvey N. ..... Minneapolis
† Nelson, Henry E. ..... Crookston
† Nelson, James W. ..... Rochester
† Nelson, Jerald C. ..... Rochester
Nelson, Lloyd S. ..... Minneapolis
Nelson, Loren E. ..... St. Paul
† Nelson, Louis A. ..... St. Paul
Nelson, Louis A., Jr. ..... St. Paul
Nelson, Luther A. ..... Rush City
Nelson, Maxine O. ..... Minneapolis
Nelson, Maynard C. ..... Minneapolis
*† Nelson, Melvin S. ..... Granite Falls
Nelson, O. L. Norman ..... Minneapolis
Nelson, Robert H. ..... Benson
Nelson, Roy A. ..... Fergus Falls
Nelson, Wallace I. ..... Minneapolis
Nelson, Wilburn O. ..... St. Peter
† Nelson, Wilhma B. ..... Albert Lea
† Nerenberg, Sidney ..... Minneapolis
Nesheim, Martin O. ..... Emmons
Ness, Richard A. ..... Fergus Falls
Nessa, Curtis B. ..... Eau Claire, Wis.
Nesse, James A. ..... Austin
Nesset, Lawren B. ..... Minneapolis
Nesset, William D. ..... Minneapolis
Neumaier, Arthur ..... Glencoe
Neumann, Roland F., Jr. ..... Minneapolis
Neumeister, Charles A. ..... Minneapolis
Niazi, Suad A. ..... Granite Falls
Nichols, Donald R. ..... Rochester
Nichols, Raymond D. ..... Crosby
† Nicholson, Murdoch A. ..... Duluth
Nickerson, John R. ..... Fairmont
Nickerson, Neil D. ..... Fairmont
Nietfeld, Aloys B. ..... Sauk Centre
Nimlos, Kenneth O. ..... St. Paul
† Nimlos, Lenore O. ..... St. Paul
Nirschl, Robert P. R. ..... St. Paul
Nisius, George F. ..... Duluth
Nixon, James B. ..... Crosby
Noble, John F. ..... St. Paul
Noble, J. Lawrence ..... St. Paul
‡ Nolan, Robert B. ..... Chelsea, Mass.
Nolan, Robert K. ..... Minneapolis
Nollet, Donald J. ..... Hibbing
Noran, Axel S. N. ..... Minneapolis
Noran, Harold H. ..... Minneapolis
Norberg, Carl E. ..... Cloquet
Nord, J. Erling ..... Staples
Nord, Robert E. ..... Minneapolis
† Nordin, Gustaf T. ..... Saratoga, Calif.
Nordland, Martin ..... Minneapolis
Nordland, Martin A. ..... Minneapolis
Nordlund, Mildred E. ..... Cass Lake
Nordman, Willard F. ..... Mora
Norman, David D. ..... St. Paul
Norman, Mark L., Jr. ..... Minneapolis
Normann, Stephen T., Jr. ..... Waseca
Norris, Neil T. ..... Caledonia
Norstrom, Craig W. ..... Rochester
Norval, Mildred A. ..... St. Paul
† Novak, Edward E. ..... New Prague
Nuebel, Charles J. ..... Sioux Falls, S. D.
† Nuessle, Walter G. ..... Springfield
Nuessle, William F. ..... Minneapolis
Nuetzman, Arthur W. ..... Faribault
Nutting, Roland E. ..... Duluth
Nydahl, Malvin J. ..... Minneapolis
Nye, Katherine A. ..... St. Paul
Nye, Lillian L. ..... St. Paul
Nygren, William T. ..... Braham
Nylander, Emil G. ..... Minneapolis
Nywall, Dean D. ..... Slayton

O'Brien, John C. ..... St. Paul
O'Brien, Louis T. ..... Breckenridge
O'Brien, William A. ..... Minneapolis
† O'Connor, Daniel C. ..... Eden Valley
O'Donnell, James E. ..... Minneapolis
O'Hanlon, John A. ..... Minneapolis
O'Kane, Thomas W. ..... St. Paul
O'Keefe, James P. ..... St. Cloud
O'Leary, John B. ..... Brainerd
O'Malley, Valentine ..... St. Paul
O'Neill, John C. ..... Duluth
O'Phelan, E. Harvey ..... Minneapolis
† O'Reilley, Bernard E. ..... St. Paul
Ochsner, Clarence G. ..... Wabasha
Ockuly, Orville E. ..... St. Paul
† Odel, Howard M. ..... Rochester
Odland, Donald M. ..... Luverne
Odland, Mark E. ..... Detroit Lakes
Odland, Olin M. ..... Granite Falls
Oeljen, Siegfried G. C. ..... Waseca
† Ogden, Warner ..... St. Paul
† Ohage, Justus ..... St. Paul
Okihiro, Michael M. ..... Rochester
Olavs, Olga ..... Minneapolis
Olds, George H. ..... New Richland
Olfelt, Paul C. ..... Minneapolis
Olinger, John Neil ..... St. Cloud
Olive, John T., Jr. ..... Mankato
Oliver, Irwin L. ..... Graceville
Oliver, James ..... Moorhead
Olmanson, Edmund G. ..... St. Peter
Olmanson, Myron D. ..... St. Peter
Olsen, Arthur M. ..... Rochester
Olsen, E. George ..... Minneapolis
Olsen, Jay R. ..... Minneapolis
Olsen, Ralph L. ..... St. Paul
Olson, Albert E. ..... Duluth
Olson, Albert J. ..... Owatonna
Olson, Alton C. ..... Minneapolis
Olson, Archie O. ..... Duluth
Olson, Carl J. ..... Minneapolis
Olson, C. Kent ..... Minneapolis
* Olson, Chester J. ..... Belle Plaine
Olson, Detlof M. ..... Minneapolis
Olson, Duane O. ..... Minneapolis
Olson, Ernest A. ..... Pine Island
Olson, Grant E. ..... West Concord
Olson, Gregory M. ..... Litchfield
Olson, Lillian A. ..... Ah-gwah-ching
‡ Olson, Olaf A. ..... Minneapolis
Olson, Philip A. ..... Minneapolis
Olson, Rolland A. ..... Wayzata
Olson, Robert T. ..... Canby
Onsgard, L. Kenneth ..... Houston
Oppegaard, Chester L. ..... Crookston
Oppen, E. Gerhard ..... Minneapolis
Oppen, Melvin G. ..... Wayzata
Opsahl, Lawrence J. ..... Willmar
Opstad, Earl T. ..... Minneapolis
Orr, Burton A. ..... Faribault
Osborn, Donald O. ..... Austin
Osmundson, Philip J. ..... Rochester
Ostergaard, Erling ..... Evansville
Ostergren, Edward W. ..... St. Paul
Oswald, Arthur J. ..... Minneapolis
Ott, Eugene C. ..... Minneapolis
† Otto, Henry C. ..... Frazee
Ouellette, Alfred J. ..... St. Paul
Ourada, Anthony L. ..... Fairmont
Overton, Dolphin H., Jr. ..... Rochester
Owen, Charles A., Jr. ..... Rochester
Owen, Richard R. ..... Minneapolis
Owens, Ben P. ..... Hibbing
Owens, Frederick M., Jr. ..... St. Paul
Owens, William A. ..... Montevideo
Ownbey, Richard P. ..... Rochester
Ozolins, Marta ..... Faribault

Paal, Dwain J. ..... Minneapolis
Paciotti, Vincent J. ..... Hibbing
‡ Packard, Dean W. ..... Unknown
Page, Raymond L. ..... Minneapolis
Palen, Benjamin J. ..... Minneapolis
Palm, Neil M. ..... St. Paul
Palmer, Clinton F. ..... Albert Lea
Palmer, Gerald K. ..... Minneapolis
Palmer, Harry A. ..... Blackduck
† Pankratz, Peter J. ..... Mountain Lake
Papermaster, Ralph ..... Two Harbors
Papermaster, Theodore C. ..... Minneapolis
Papp, Andrew ..... Rochester
Paris, Jaime ..... Rochester
Park, Wilford E. ..... Minneapolis
Parker, Charles W. ..... Wadena
Parker, Robert L. ..... Rochester
Parker, Warren E. ..... Sebeka
Parker, Wilbert H. ..... Chisholm
Parkhill, Edith M. ..... Rochester
Parkin, Thomas W. ..... Rochester
Parr, Eugene Q. ..... Rochester
Parson, E. Irvine ..... Duluth
Parson, E. Lillian B. ..... Elbow Lake
Parson, Lester R. ..... Elbow Lake
Parsons, R. A. ..... St. James
Parsons, Ralph L. ..... Trimont
Pascuzzi, Chris A. ..... Rochester
Pasek, Antone W. ..... Cloquet
Patch, Orien B. ..... Duluth
Patrick, Robert T. ..... Rochester
Pattee, James J. ..... Minneapolis
Patten, John C. ..... Austin
Patterson, Hugh D. ..... Slayton
† Patterson, Richard J. ..... Rochester
† Patterson, William L. ..... Fergus Falls
Paulson, Elmer C. ..... Minneapolis
Paulson, John A. ..... Rochester
† Paulson, Theodore S. ..... Fergus Falls
Paulson, Wallace J. ..... St. Paul
Paulus, Harold E. ..... Austin
Payne, Richard E. ..... Virginia
Payne, William S. ..... Rochester
† Pearsall, R. P. ..... Virginia
Pearson, Bor F. ..... Shakopee
Pearson, Fritz R. ..... St. Paul
Pearson, Malcolm M. ..... St. Paul
Pease, Gertrude L. ..... Rochester
Peck, Willard R. ..... St. Paul
Pedersen, Arthur H. ..... St. Paul
Pedersen, Robert L. ..... Brainerd
Pedersen, Roy C. ..... Duluth
Peluso, Charles R. ..... Minneapolis
Pelzl, Charles R. ..... Pine River
† Pemberton, John deJ. ..... Rochester
Penk, Engward L. ..... Springfield
Penn, George E. ..... Mankato
† Pennie, Daniel F. V. ..... Duluth
† Peppard, Thomas A. ..... Minneapolis
Perkins, Douglass E. ..... Alexandria
Perlman, Everett C. ..... Minneapolis
Perlman, Herschel L. ..... Minneapolis
Perry, Harold ..... Rochester
† Perry, Richard E. ..... Rochester
Person, John P. ..... Albert Lea
Pertl, Albert L. ..... Canby
Peteler, Jennings C. J. ..... Minneapolis
Peters, Gustavus A. ..... Rochester
Petersen, Byron D. ..... Minneapolis
Petersen, Deane A. ..... Wayzata
Petersen, Donald H. ..... Northfield
Petersen, Glenn L. ..... Minneapolis
Petersen, Magnus C. ..... Rochester
Petersen, Peter C. ..... Minneapolis
Petersen, Robert T. ..... St. Cloud
Petersen, William E. ..... Minneapolis
Peterson, Alvin C. ..... Mora
Peterson, David B. ..... St. Paul
Peterson, Donald B. ..... Anoka
Peterson, Donald H. ..... St. Paul
Peterson, Edward A. ..... St. Paul
Peterson, Edward N. ..... Virginia
Peterson, Harold O. ..... St. Paul
Peterson, Herbert W. ..... Minneapolis
Peterson, Joel L. E. ..... St. Paul
Peterson, John A. ..... St. Paul
Peterson, John H. ..... Duluth
Peterson, Kenneth A. ..... Marshall
Peterson, Kenneth H. ..... Hutchinson
Peterson, Lowell F. A. ..... Rochester
Peterson, Nordahl P. ..... Minneapolis
† Peterson, Oliver H. ..... Minneapolis
Peterson, Oliver H., Jr. ..... Minneapolis
Peterson, Palmer A. ..... Minneapolis
† Peterson, Peter E. ..... Minneapolis
Peterson, Roy A. ..... Vesta
Peterson, Roy L. ..... White Bear Lake
Peterson, Stanley C. ..... Austin
Peterson, W. H. ..... Austin
Peterson, Willard C. ..... Minneapolis
Peterson, Willard E. ..... Willmar
Peterson, Willard H. ..... Minneapolis
Petit, Julien V. ..... Minneapolis
† Petit, Leon J. ..... Minneapolis
Petraborg, Harvey T. ..... Aitkin
Pettersen, George R. ..... Aitkin
Pewters, John T. ..... Minneapolis
Peyton, William T. ..... Minneapolis
Phares, Otto C. ..... St. Cloud
† Phelps, Kenneth A. ..... Menlo Park, Calif.
Phillips, Leonard ..... St. Paul
Philp, David R. ..... Watertown
Pierce, Jack R. ..... Williamson, W. Va.
Pierce, Robert B. ..... Renville
Pierce, Charles H. ..... Wadena
Pierson, Roy F. ..... Slayton
Pincus, Mitchell ..... Minneapolis
† Piper, Monte C. ..... La Canada, Calif.
† Piper, William A. ..... Mountain Lake
Plasha, Matthew K. ..... Anoka
Plass, Herbert F. R. ..... Minneapolis
Plimpton, Nathan C. ..... Minneapolis
Plotke, Harry L. ..... St. Paul
Plucker, Milton W. ..... Worthington
Plum, George Elwood ..... Rochester
Pohl, John F. M. ..... Minneapolis
† Poirier, Joseph A. ..... Forest Lake
Pollak, Kurt ..... Minneapolis
Pollard, William S. ..... Duluth
Polley, Howard F. ..... Rochester
Pollman, Stanley E. ..... Thief River Falls
Pollock, Anthony J. ..... Minneapolis
† Pollock, David K. ..... Minneapolis
Polski, Paul G. ..... South St. Paul
Polzak, Jacob A. ..... Minneapolis
Pone, John ..... Cambridge
Pool, Thomas L. ..... Rochester
Popadiuk, Peter ..... Minneapolis
Popovich, Dragojla ..... Anoka
† Poppe, Frederick H. ..... Coral Gables, Fla.
† Porter, Oliver M. ..... Minneapolis
Posey, Edward ..... Minneapolis
Posey, John W. ..... Rochester
Post, Edmund A. ..... St. Paul
Potter, Robert B. ..... Minneapolis
Potts, L. C. ..... Warroad
Power, John E. ..... Duluth
Power, John E., Jr. ..... Duluth
† Pratt, Fred J., Sr. ..... Minneapolis
Pratt, Fred J., Jr. ..... Minneapolis
Pratt, Joseph H., Jr. ..... Rochester
† Preine, Irving A. ..... Osseo
† Preisinger, Joseph W. ..... Dallas, Texas
Prentice, Walter B. ..... St. Paul
Prem, Konald A. ..... Minneapolis
*† Preston, Paul J. ..... Minneapolis
Price, William Edmund ..... Minneapolis
Prickman, Louis E. ..... Rochester
Priest, Robert E. ..... Minneapolis
Priestley, James T. ..... Rochester
† Prim, Joseph A. ..... Minneapolis
Prins, Leo R. ..... Albert Lea
Prlina, Isaac M. ..... Virginia
Proeschel, Ray K. ..... Willmar
Proffitt, William E. ..... Minneapolis
Proshek, Lumir C. ..... Minneapolis
Proud, Harry S. ..... St. Paul
Pugh, David G. ..... Rochester
† Pulec, Jack Lee ..... Rochester
Pumala, Erven E. ..... Warren
Purnell, Don C. ..... Rochester
Purves, G. Harland ..... Buffalo
Puumala, Reino H. ..... Cloquet

Quanstrom, Virgil E. ..... Brainerd
Quattlebaum, Frank W. ..... St. Paul
Quello, Robert O. B. ..... Minneapolis
Quiggle, Arthur B. ..... Minneapolis
Quist, Henry W., Jr. ..... Minneapolis

Raaen, Olaf ..... St. Paul
Raattama, John W. ..... Keewatin
Rabcevich, Anatole ..... St. Paul
Racer, Harley J. ..... Minneapolis
Radke, Robert L. ..... Montevideo
Raetz, Sylvester J. ..... Maple Lake
Raile, Richard B. ..... Minneapolis
Rajala, Arnold I. ..... Grand Rapids
Ralph, James R. ..... St. Paul
Ralston, Donald E. ..... Rochester
Ramlow, Ralph M. ..... St. Paul
Ramsdell, John A. ..... White Plains, N. Y.
† Ramsey, Walter R. ..... St. Paul
Randall, Lawrence M. ..... Rochester
Randall, Raymond V. ..... Rochester
Ransom, H. Robert ..... Osseo
*† Ransom, Matthias L. ..... Hancock
Rasmussen, Ramby C. ..... St. Paul
Ratelle, Alexander E. ..... Minneapolis
Raths, Otto N., Jr. ..... St. Paul
Ravits, Harold G. ..... St. Paul
Rayner, Ralph R. ..... St. Paul
Rea, Charles E. ..... St. Paul
Reardon, Andrew E. ..... Duluth
Reeber, Erick ..... Thief River Falls
Reed, Henry H. ..... Duluth
Reed, Paul ..... Virginia
Reed, Sheldon C. ..... Minneapolis
Reff, Alan R. ..... Crookston
Regan, John J. ..... Minneapolis
Regnier, Edward A. ..... Minneapolis
Reichel, Samuel M. ..... Minneapolis
Reichelderfer, Charles F. ..... Staples
Reichelt, Leland G. ..... Wadena
Reid, James W. ..... South St. Paul
Reif, Harold A. ..... Minneapolis
Reif, Henry J. ..... St. Cloud
Reif, Robert W. ..... White Bear Lake
Reiley, Richard E. ..... Minneapolis
Reinhardt, James H. ..... Alexandria
Reiser, Milton P. ..... Minneapolis
Reitemeier, Richard J. ..... Rochester
Reitmann, John H. ..... Hastings
Remine, William H., Jr. ..... Rochester
Remole, William D. ..... Minneapolis
Remsberg, Robert R. ..... Tracy
† Replogle, William H. ..... Los Angeles, Calif.
Resch, Joseph A. ..... Minneapolis
Restall, Charles J. ..... Rochester
Reuland, John J. ..... Rochester

Reynolds, Donald P. ... Minneapolis
‡ Reynolds, William A. ... New York, N. Y.
Rhoads, Donald V. ... Rochester
Rholl, Arnold O. ... Minneapolis
Rice, Carl O. ... Minneapolis
Rice, Frank B. ... Robbinsdale
Rice, Fred A. ... Minneapolis
Rice, Hagbart G. ... Moorhead
Richards, Albert M. ... St. Paul
Richards, Ernest T. F. ... St. Paul
Richards, William B. ... St. Cloud
Richardson, Edward J., Jr. ... St. Paul
Richardson, Robert J. ... Minneapolis
Richdorf, Lawrence F. ... Minneapolis
Richter, David J. ... Virginia
Rick, Paul F. W. ... St. Paul
Rieke, Wellington W. ... Wayzata
Rieschl, Elizabeth K. ... Jordan
Rimas, Matthew J. ... Comfrey
Ringle, Otto F. ... Walker
Rinkey, Eugene ... St. Paul
Riordan, Elsie M. ... Minneapolis
Ripple, Rudolph J. ... St. Paul
Ripple, Rudolph J., Jr. ... Minneapolis
Risch, Ronald E. ... Minneapolis
Risser, Alden F. ... Stewartville
Ritchie, Wallace P. ... St. Paul
Ritt, Albert E. ... St. Paul
† Rivers, Morris H. ... Rochester
Rizer, Dean K. ... Minneapolis
*† Rizer, Robert I. ... Wayzata
Roach, Donald E. ... St. Paul
Roan, Orville M. ... Minneapolis
Robb, Edwin F. ... Minneapolis
Robbins, Mason C. ... St. Paul
Robbins, Owen F. ... Minneapolis
Roberts, Byron H. ... Minneapolis
Roberts, Frank E. ... Reno, Nevada
Roberts, George A. ... Austin
Roberts, Lewis J. ... Minneapolis
Roberts, Oliver W. ... Owatonna
Roberts, Stanley W. ... Minneapolis
Robertson, Paul A. ... Austin
Robilliard, Charles M. ... Faribault
Robinett, Robert W. ... Worthington
Robinson, Cortland O. ... Minneapolis
Rock, William H. ... Anoka
Rocknem, Robert E. ... Minneapolis
Rockwell, Curtiss V. ... Minneapolis
Rockwood, Philo H. ... Fergus Falls
† Rodda, Frederick C. ... Minneapolis
Rodgers, Richard S. ... Minneapolis
Rodling, Herbert ... Rochester
Roehlke, Arthur B. ... Elk River
Roemer, Henry J. ... Winona
Rogers, Charles W. ... Winona
Rogin, Norton ... Minneapolis
Rogne, William ... Spring Grove
Roholt, Christian L. ... McIntosh
Roholt, Hartvig B. ... Fosston
Rohrer, Christian A. ... Worthington
Rohrer, Thomas P. ... Waseca
Rolig, David H. ... St. Paul
Rollie, Orris O. ... St. Paul
Rollins, Pat ... Wayzata
Rome, Howard P. ... Rochester
Romness, Kenneth B. ... Mound
Rooke, Edward D. ... Rochester
Rorem, Joseph A. ... Appleton
Rose, John T. ... Lakefield
Rosenbaum, David L. ... Minneapolis
Rosendahl, Frederick G. ... Minneapolis
Rosenfield, Abraham B. ... Minneapolis
Rosenow, John H. ... Minneapolis
Rosenthal, F. Harold ... Austin
Rosenthal, Robert ... St. Paul
† Rosenwald, Reuben M. ... Coon Rapids
Ross, Alexander J. ... Minneapolis
Ross, Griff T. ... Bethesda, Md.
Ross, James V., Jr. ... Rochester
Ross, Margaret ... Rochester
Rossberg, Raymond A. ... Morris
Rossen, Ralph X. ... Minneapolis
Rossing, Robert G. ... St. Paul
Rotenberg, Robert J. ... Minneapolis
Rotenberg, Samuel ... Minneapolis
Roth, Frederick D. ... Mankato
Roth, George C. ... St. Paul
Roth, Harry L. ... Rochester
Rothnem, Morris S. ... Minneapolis
† Rothschild, Harold J. ... St. Paul
Roust, Henry A. ... Montevideo
Rovelstad, Randolph A. ... Rochester
† Rovelstad, Roger A. ... Yonkers, N. Y.
Rowe, Clarence J., Jr. ... St. Paul
† Rowe, Olin W. ... Duluth
† Rowland, Spencer A. ... Rochester
Rowles, Everett K. ... Coleraine
Roy, Phil C. ... St. Paul
Rozycki, Anthony ... St. Cloud
Ruchie, Warren H. ... Willmar
Rucker, Charles W. ... Rochester
Rucker, W. Henry ... Minneapolis
Rud, Norman E. ... Minneapolis
*† Rudell, Gustave L. ... Minneapolis
Rudie, Peter S. ... Duluth
Rudie, William D. ... Duluth
† Ruffolo, Eugene H. ... Rochester
Ruggles, George M. ... Forest Lake
† Ruhberg, George N. ... Santa Barbara, Calif.
Rukavina, John G. ... St. Paul
† Rulon, John T. ... Rochester
Rumpf, Carl W. ... Faribault
Runquist, John M. ... Duluth
Runquist, Richard K. ... Anoka
Rushay, Arthur J. ... White Bear Lake
Rushing, Lige B., Jr. ... New Orleans, La.
Rushton, Joseph G. ... Rochester
Russ, Homer H. ... Blue Earth
Russeth, Arthur N. ... Minneapolis
Rusten, Elmer M. ... Minneapolis
Rusterholz, Alan P. ... St. Paul
Ruth, Bradley R. ... Duluth
Rutledge, John B. ... Detroit Lakes
Rutledge, Lloyd H. ... Detroit Lakes
† Ryan, John J. ... St. Paul
Ryan, Joseph M. ... St. Paul
Ryan, William J. ... Duluth
Rydburg, Wayne C. ... Minneapolis
Ryding, Vincent ... Mountain Lake
Rydland, Arne D. ... Minneapolis
Rygh, Harold N. ... Atwater
Rynearson, Edward H. ... Rochester
Rysgaard, George N. ... Northfield

St. Cyr, Harry M., Jr. ... Robbinsdale
St. Cyr, Kenneth J. ... Robbinsdale
Sach-Rowitz, Alvan ... Moose Lake
Sadler, William P. ... Minneapolis
Saffert, Cornelius A. ... New Ulm
Sahr, Walter G. C. ... Hutchinson
† Salamone, Charles R. ... Rochester
Salassa, Robert M. ... Rochester
Saliterman, Bernard I. ... Minneapolis
Salk, Richard J. ... Albany
Salter, Reginald A. ... Virginia
Sandeen, Robert M. ... Buffalo
† Sanderson, Anton G. ... Ashby
Sanderson, David J. ... Fergus Falls
† Sanderson, David R. ... Rochester
Sandler, Bernard ... Minneapolis
Sandt, Karl E. ... Minneapolis
† Sandven, Nels O. ... Paynesville
Sanford, John B. ... Duluth
Sanford, Raymond A. ... Mankato
† Sarff, Oliver E. ... Duluth
Sarnecki, M. M. ... St. Paul
Sasano, Joseph R., Jr. ... Rochester
† Satersmoen, Theodore ... Pelican Rapids
Sather, Edgar L. ... Fosston
Sather, Edgar R. ... Alexandria
Sather, George A. ... Fosston
Sather, Richard N. ... Fosston
Sather, Russell O. ... Crookston
Satterlee, Howard W. ... Lewiston
† Satterlund, Victor L. ... New Richmond, Wis.
Sauer, William G. ... Rochester
Sawatzky, William A. ... Minneapolis
Sawtell, Robert R. ... Worthington
Sax, Milton H. ... Duluth
Sax, Simon G. ... Duluth
Saxman, Gertrude E. O. ... Georgetown
Sayre, George P. ... Rochester
Sborov, Abe M. ... Minneapolis
Scallen, Raymond W. ... Minneapolis
Scanlon, Paul W. ... Rochester
Schaaf, Frederick H. K. ... Minneapolis
Schaar, Frances E. ... Minneapolis
Schade, Frederick L. ... Worthington
Schaefer, Joseph C. ... Orange Park, Fla.
Schaefer, Joseph F. ... Owatonna
Schaefer, Kenneth F. ... Minneapolis
Schaefer, Wesley G. ... Minneapolis
Schafer, Thomas L. ... Minneapolis
Schaffhausen, Irwin F. ... Minneapolis
Schaffhausen, Mildred ... Minneapolis
Schamber, Walter F. ... Parkers Prairie
Scheidel, Alois M. ... Mankato
Scheifley, Charles H. ... Rochester
† Scheldrup, N. H. ... Minneapolis
Scherer, Leslie R. ... Minneapolis
Scherling, Sidney S. ... Minneapolis
Scheuneman, Allen F. ... Warroad
Schiele, Burtrum C. ... Minneapolis
Schimelpfenig, George T. ... Chaska
Schirber, Martin J. ... Grand Rapids
Schirger, Alexander ... Rochester
Schissel, Gregory A. ... Minneapolis
Schmid, John F. ... Duluth
Schmidt, Charles D. ... Rochester
Schmidt, Herbert W. ... Rochester
Schmidt, Hilmar R. ... Rushford
† Schmidt, Paul A. ... Aurora, Ill.
Schmidt, Paul G., Jr. ... Granite Falls
Schmidt, Ruben F. ... Alden
Schmidt, W. Robert ... Minneapolis
Schmidtke, Reinhardt L. ... St. Paul
† Schmitt, S. C. ... Los Angeles, Calif.
Schmitz, Anthony A. ... Mankato
Schmitz, Everett J. ... St. Cloud
Schnabel, Robert F. ... Crookston
Schneck, Jack I. ... Minneapolis
Schneider, Lawrence E. ... Duluth
Schneider, Paul J. ... Adams
Schnell, Frederick S. ... Litchfield
† Schoch, Robert B. J. ... St. Paul
Schoeneberger, P. B. ... Perham
*† Scholpp, Otto W. ... Hutchinson
Scholz, Donald A. ... Rochester
Schons, Edward ... St. Paul
Schossow, George W. ... Erskine
Schottler, Max E. ... Minneapolis
† Schroder, Charles H. ... Pottstown, Penn.
Schroeckenstein, Hugo F. ... St. Paul
Schroeder, Albert J. ... Minneapolis
Schroeppel, John E. ... Winthrop
Schulberg, Verne A. ... Gaylord
† Schuldt, Fredrick C. ... St. Paul
Schultz, Alvin L. ... Minneapolis
Schultz, Earl A. ... Minneapolis
Schultz, J. Harold ... Minneapolis
Schultz, Peter J. ... Minneapolis
Schulz, Robert W. ... Fairmont
† Schulze, Albert G. ... St. Paul
Schulze, William M. ... Minneapolis
Schumacher, John W. ... Minneapolis
Schut, John W. ... Anoka
Schutz, Elmer S. ... Mountain Lake
Schwartz, Carl A. ... Austin
Schwartz, E. Robert ... Minneapolis
‡ Schwartz, John T. ... Norfolk, Va.
Schwartz, Virgil J. ... Minneapolis
Schweiger, Theodore R. ... Hibbing
Schwyzer, Hanns C. ... St. Paul
Schwyzer, Marquerite ... St. Paul
Scott, Eugene E. ... St. Paul
Scott, Horace G. ... Minneapolis
‡ Scott-Miller, James R. ... Phoenixville, Pa.
Scudamore, Harold H. ... Rochester
† Seaberg, John A. ... Pequot Lakes
Seashore, Rosel T. ... Duluth
Seay, James E. III ... Hopkins
† Sedlack, Richard E. ... Rochester
Seery, Thomas M. ... Austin
Segal, Edward L. ... Minneapolis
Segal, Martin A. ... Minneapolis
† Seham, Max ... Minneapolis
Seifert, Donald R. ... North St. Paul
Seifert, Milton H. ... Excelsior
Seifert, Otto J. ... New Ulm
Sekanina, Jan ... Babbitt
Sekhon, Mohan S. ... St. Paul
Selck, Wolfgang T. ... Hastings
Seldon, Thomas H. ... Rochester
Sells, Richard J. ... St. Paul
Selmo, Joseph D. ... Norwood
Semler, Herbert J. ... Rochester
Semsch, Robert D. ... Wayzata
Sethre, Arthur E. ... Fergus Falls
Setzer, Hobert J. ... St. Paul
Setzer, Hobert J., Jr. ... Mankato
† Shamblin, James Roscoe, Jr. ... Rochester
Shandorf, James F. ... Minneapolis
Shannon, William R. ... St. Paul
Shaperman, Eva P. ... Minneapolis
Shapiro, Irving ... Minneapolis
Shapiro, Sidney K. ... Minneapolis
Sharp, David V. ... Minneapolis
Shaver, Ward ... Fergus Falls
Shaw, Howard A. ... Minneapolis
Shea, Andrew W. ... Minneapolis
Sheedy, Chester Leo ... Austin
Shelander, Marcus I. ... St. Paul
† Shellman, John L. ... Pacific Palisades, Calif.
Sheppard, Charles G. ... Hutchinson
Sher, David A. ... Virginia
Sher, Lewis ... Minneapolis
Sherman, Alfred G. ... Albert Lea
Sherman, Carnot H. ... Bayport
† Sherman, Charles L. ... Luverne
Sherman, Lloyd F. ... Minneapolis
Sherman, Morris H. ... Minneapolis
Sherman, Royal V. ... Red Wing
‡ Sherrick, Donald W. ... Fort Leonard Wood, Mo.
Shick, Richard M. ... Rochester
Shillington, Maurice A. ... Brainerd
Shin, Rok W. ... Howard Lake
Shragg, Robert I. ... Minneapolis
Shronts, John F. ... Minneapolis
† Sibley, William L., III ... Rochester
Sidell, Franklin D. ... Minneapolis
Siegel, Clarence ... St. Paul
Siegel, John S. ... Virginia
Siegmann, William C. ... Minneapolis
Siekert, Robert G. ... Rochester
Silas, Ralph M. ... Minneapolis
Silver, John D. ... Minneapolis
Silverman, Lloyd ... Rochester
Silverstein, Murray N. ... Rochester

Silvis, Stephen E.....San Francisco, Calif.
Simison, Carl.....Barnesville
Simmonds, Harry N.....Prior Lake
Simmons, Richard K.....Minneapolis
Simons, Bernard H.....Chaska
† Simons, Jalmar H.....Aspen, Colo.
† Simons, John N.....Rochester
Simons, Leander T.....St. Paul
Simonson, Donald B.....Minneapolis
Simonton, Kinsey M.....Rochester
† Simpson, Ellery De W.....Asheville, N. C.
Sinamark, Andrew.....Hibbing
Singbeil, J. H.....Breckenridge
Singer, Benjamin J.....St. Paul
Sinykin, Melvin B.....Minneapolis
Sipe, James W.....Coon Rapids
Siperstein, David M.....Minneapolis
Sisk, Harvey E.....St. Cloud
Sisler, Clifford E.....Minneapolis
Sisterman, Thomas J.....Minneapolis
Sjoding, J. Donald.....Mankato
Sjostrom, Lawrence E.....St. Peter
Skaife, William F.....Benson
Skaug, Harold M.....Chatfield
Skinner, Abbott.....St. Paul
† Skinner, Harvey O. .....St. Paul
Skjold, Arthur C.....Minneapolis
Skogerboe, Rudolph B.....Karlstad
† Skworcow, George.....Minneapolis
Slocumb, Charles H.....Rochester
Smiley, Donald P.....St. Paul
Smiley, John T.....Minneapolis
Smisek, Elmer A.....St. Paul
Smisek, Frank M. E.....Minneapolis
Smith, Adam M.....Minneapolis
Smith, Archie M.....Minneapolis
Smith, Baxter A., Jr.....Minneapolis
Smith, Cyril M.....Duluth
† Smith, Don V.....Blue Earth
† Smith, Fredrick L.....Rochester
Smith, George R.....Hutchinson
Smith, Graham G.....Minneapolis
Smith, Harry J.....Lake Crystal
† Smith, Harry L.....Rochester
Smith, John E.....Minneapolis
† Smith, John H.....Rochester
Smith, Lloyd A.....Willmar
Smith, Lucian A.....Rochester
† Smith, Margaret I.....Gardena, Calif.
† Smith, Myron W.....Red Wing
Smith, Nadine G.....Minneapolis
Smith, Norvin R.....Willmar
Smith, Paul M.....Lake Crystal
Smith, Ralph E.....Rochester
Smith, Reginald A.....Rochester
Smith, Theodore S.....Minneapolis
Smith, Thorsten.....Faribault
Smith, Vernon D. E.....St. Paul
Smith, Wallace R.....Grand Marais
Smith, William T.....Minneapolis
Smorstok, Matthew B.....Monticello
Smyth, John J.....Lester Prairie
Smythe, Lowell J.....Austin
Snider, Howard R.....Mankato
Snyder, Clifford D.....Kiester
Snyder, George W.....St. Paul
Snyker, Omer E.....Ely
Soderberg, Richard J.....Grand Marais
Soderlind, Ragnar T.....Minneapolis
Sohlberg, Olof I.....St. Paul
Solhaug, Samuel B., Jr.....Minneapolis
† Solsem, Fredrick N. S.....Spicer
Solvason, Harold M.....Minneapolis
‡ Sommer, Robert K.....Markham, Ill.
Sommerdorf, Vernon L.....St. Paul
Sommers, Ben.....St. Paul
Sones, Donald A.....Rochester
Sonnesyn, Nels N.....Le Sueur
Sontag, David W.....Lake City
Sorem, Milton B.....St. Paul
† Sorenson, James M.....Rochester
Soucheray, Philip H.....St. Paul
Soule, Edward H.....Rochester
Souster, Benjamin B.....St. Paul
Sowada, Ernest J.....St. Paul
Spain, W. Thomas.....Evansville, Ind.
Spang, Anthony J.....Duluth
Spang, James S.....Duluth
Spang, William M.....Duluth
Spano, Joseph P.....Minneapolis
Speckhals, Robert C.....Faribault
Spencer, Bernard J.....Minneapolis
Spencer, Robert J.....Rochester
Sperl, Michael P., Jr.....St. Paul
Spiekerman, Ralph E.....Rochester
Spink, Wesley W.....Minneapolis
Spittel, John A., Jr.....Rochester
Sponsel, Kenath H.....Minneapolis
Sprafka, Gregory A.....St. Paul
Sprafka, Joseph L.....St. Paul
Sprague, Randall G.....Rochester
† Spratt, Charles N.....Minneapolis
Spurbeck, George H.....Bemidji
Spurgeon, Frederick C.....Rochester
Spurzem, Raymond J.....Anoka
Stadem, Clifford J.....Twin Valley
Stahl, George W.....Austin
Stahr, Aubrey C.....Hopkins
Stahler, Paul A.....Jordan
Stahn, Louis H.....Fergus Falls
Stam, John.....Worthington
† Stanford, Charles E.....Minneapolis
† Stangl, Philip E.....St. Cloud
† Stanley, Court R.....Minneapolis
† Stanley, Kenneth E., Jr.....Rochester
Starekow, Milton D.....Thief River Falls
Staub, Henry P.....Minneapolis
Stauffer, Maurice H.....Rochester
Steffens, Leon A.....Red Wing
Stein, Raymond J.....Pierz
Stein, William A.....Duluth
Steinberg, Charles L.....St. Paul
Steiner, Leon E.....Albert Lea
Steinhilber, Richard M.....Rochester
Steinhour, Jerold F.....Rochester
Stelter, Lloyd A.....Minneapolis
Stemsrud, Harold L.....Alexandria
Stennes, John L.....Minneapolis
† Stenstrom, Annette T...Marine-on-St. Croix
Stephens, William E.....Minneapolis
Sterner, Donald C.....St. Paul
Sterner, Ernest R.....St. Paul
Sterner, John J.....St. Paul
Sterrie, Norman A.....Minneapolis
Stewart, Donald E.....Crookston
Stewart, Marvin J.....Minneapolis
Stewart, Rolla I.....Minneapolis
Stickney, J. M.....Rochester
Stiegler, Farrell S.....Minneapolis
Stiles, Clifford D.....Foley
Stillwell, George K.....Rochester
Stillwell, Walter G.....Mankato
Stilwell, George G.....Rochester
Stoesser, Albert V.....Minneapolis
Stolen, Keith H.....Grand Rapids
Stolpestad, Armer H.....St. Paul
Stolz, Robert C.....Minneapolis
Stoltze, Cynthia A.....Rochester
† Stomel, Joseph.....Los Angeles, Calif.
Stone, Norman F.....Minneapolis
Stone, Stanley P.....Minneapolis
Stool, Newson.....Rochester
Storsteen, Kenneth A.....Duluth
Stoy, Robert A.....Little Falls
Strand, Jack W.....St. Paul
Stransky, Theodore W.....Owatonna
Strate, Gordon E.....St. Paul
Strathern, Carleton S.....St. Peter
† Strathern, Fred P.....St. Peter
† Strathern, Moses L.....Gilbert
Stratte, Alf K.....Pine City
Stratte, Harold C.....Windom
Strauchler, Jonas.....Belview
Straus, Maurice L.....St. Paul
Street, Bernard.....Northfield
Streitz, John M.....Duluth
Strem, Edward L.....St. Paul
Strewler, Gordon J.....Duluth
Strickland, Martha J. B.....St. Paul
Strickler, Jacob H.....Minneapolis
† Striebel, James L.....Rochester
Stroebel, Charles F., Jr.....Rochester
Strom, Gordon W.....Minneapolis
Stromgren, Delph T.....Minneapolis
Stromme, William B.....Minneapolis
Strunk, Clarence A.....Minneapolis
† Student, Richard E.....Minneapolis
Studer, Donald J.....Faribault
† Stuhr, John W.....Stillwater
Sturges, Robert L.....Minneapolis
Sturgis, John A.....Lamberton
Sturley, Rodney F.....St. Paul
Subak, Barbara H.....Minneapolis
† Subby, Walter.....Wayzata
Sukov, Marvin.....Minneapolis
Sullivan, Charles R.....Rochester
Sullivan, Raymond M.....Minneapolis
Sullivan, William A., Jr.....Minneapolis
Summar, M. Thomas.....Virginia
Sundberg, Arthur B.....Heron Lake
* Sutherland, Harry N.....Ely
Svien, Hendrik J.....Rochester
† Swanson, John A.....St. Paul
Swanson, Lawrence J.....St. Paul
Swanson, Ralph H.....West St. Paul
Swanson, Roy E.....Minneapolis
Swedberg, William A.....Duluth
Swedenburg, Paul A.....Glenwood
† Swedlund, Harry A.....Rochester
Sweetser, Horatio B.....Minneapolis
Sweetser, Theodore H.....Minneapolis
Sweetser, Theodore H., Jr.....Minneapolis
† Sweitzer, Samuel E.....Minneapolis
† Swendseen, Carl G.....Minneapolis
Swendseen, Carl J.....Graceville
Swendson, James J.....St. Paul
Swenson, Arnold O.....Duluth
Swenson, Donald B.....St. Paul
Swenson, Donald B.....Mankato
Swenson, Floyd J.....Cook
Swenson, Orvie J.....Waseca
Swenson, Paul C.....St. Paul
† Swenson, Richard W.....Minneapolis
Swenson, Roy G.....North Branch
Symmonds, Richard E.....Rochester
Syverson, Leslie A.....Fergus Falls
Syverton, Jerome T.....Minneapolis

Taintor, Ronald W.....Marshall
Tam, Ernest C.....Minneapolis
Tama, Lawrence.....Rochester
Tangen, George M.....Minneapolis
Tani, George T.....St. Paul
Tanquist, Edwin J.....Alexandria
Taswell, Howard F.....Rochester
Taufic, Mansur.....Austin
Tauxe, Welby N.....Rochester
Taylor, Joseph H.....Minneapolis
Taylor, Lawrence C.....Rochester
Taylor, William E.....Minneapolis
Teich, Kenneth W.....Duluth
Teisberg, John E.....St. Paul
Tenner, Robert J.....Minneapolis
Terrell, Bernard J.....Nopeming
Tesar, Charles E.....Minneapolis
Tesch, Gordon H.....Elk River
Testor, James V.....Winona
Tetlie, James P.....Duluth
Textor, Jerome.....Anoka
Teynor, Joseph W.....Rochester
Thal, Alan P.....Minneapolis
Thayer, Ellsworth A.....Fairmont
Theobalt, Inge M.....Minneapolis
Thielen, Robert D.....St. Michael
Thiem, Chester E.....Mankato
Thill, Leonard J.....Balaton
Thomas, John V.....Duluth
Thomas, Juergen E.....Rochester
Thomas, William H.....Lindstrom
Thomes, A. Boyd.....Minneapolis
Thompson, A. Henry.....St. Peter
Thompson, Arthur .....Minneapolis
Thompson, Carl O.....Hendricks
Thompson, Floyd A.....St. Paul
Thompson, Gershom J.....Rochester
Thompson, John W., III.....Rochester
Thompson, Russell A.....Minneapolis
Thompson, Willis H.....Minneapolis
Thomson, James M.....Austin
Thoreson, M. C. Bernice.....St. Paul
Thorsen, David S.....Minneapolis
Thorsgard, Ernest O.....Thief River Falls
Thorson, Stuart V.....Minneapolis
Thouin, Laurence G.....Hibbing
Thurber, Deloran L.....Rochester
Thuringer, Carl B.....St. Cloud
Thurn, Roy J.....Duluth
Thysell, Desmond M.....Minneapolis
† Thysell, Fred A.....Moorhead
Thysell, Harold R.....Crookston
Thysell, Vernon D.....Hawley
Tiffany, Francis B.....St. Paul
Tifft, Cyril R.....St. Paul
Tillisch, Jan H.....Rochester
Timp, Leo.....St. Cloud
Tinkham, Robert G.....Minneapolis
Titrud, Leonard A.....Minneapolis
Titus, Jack L.....Rochester
Tobin, John D.....Minneapolis
Todd, John C.....Austin
Todd, Thomas N. F.....Minneapolis
† Tomhave, Wesley G.....Chicago, Ill.
Tongen, Lyle A.....St. Paul
Torghele, John R.....Ingleside, Neb.
Tosseland, Noel E.....Duluth
Trach, Benedict B.....Minneapolis
Traeger, Carl A.....Faribault
Trautmann, James C.....Duluth
Travis, James S.....St. Paul
* Traxler, J. Felix.....Henderson
Treacy, William L.....Rochester
Tregilgas, Harold R.....South St. Paul
Tregilgas, Richard B.....St. Paul
Trelle, H. Dieter.....Rochester
† Troost, Henry B.....Mankato
Trow, James E.....Minneapolis
Trow, William H.....Minneapolis
Trueman, Harold S.....Minneapolis
Truesdale, Clark W.....Glencoe
† Tsai, Shih Hao.....Hopkins
Tucker, Richard C.....Minneapolis
Tudor, Richard B.....Minneapolis
† Tuffanelli, Denny L.....Rochester
‡ Tuohy, Edward L.....Santa Barbara, Calif.
† Turnacliff, Dale D.....St. Paul
† Tutton, Roger H.....Rochester
Tuura, James L.....Duluth
Tveten, Omar A.....St. Paul
Tweedy, John A.....Winona
Tweedy, Robert B.....Winona

Twidwell, Joseph E.....Minneapolis
Twiggs, Leo F.....Austin
Twomey, John E.....Minneapolis

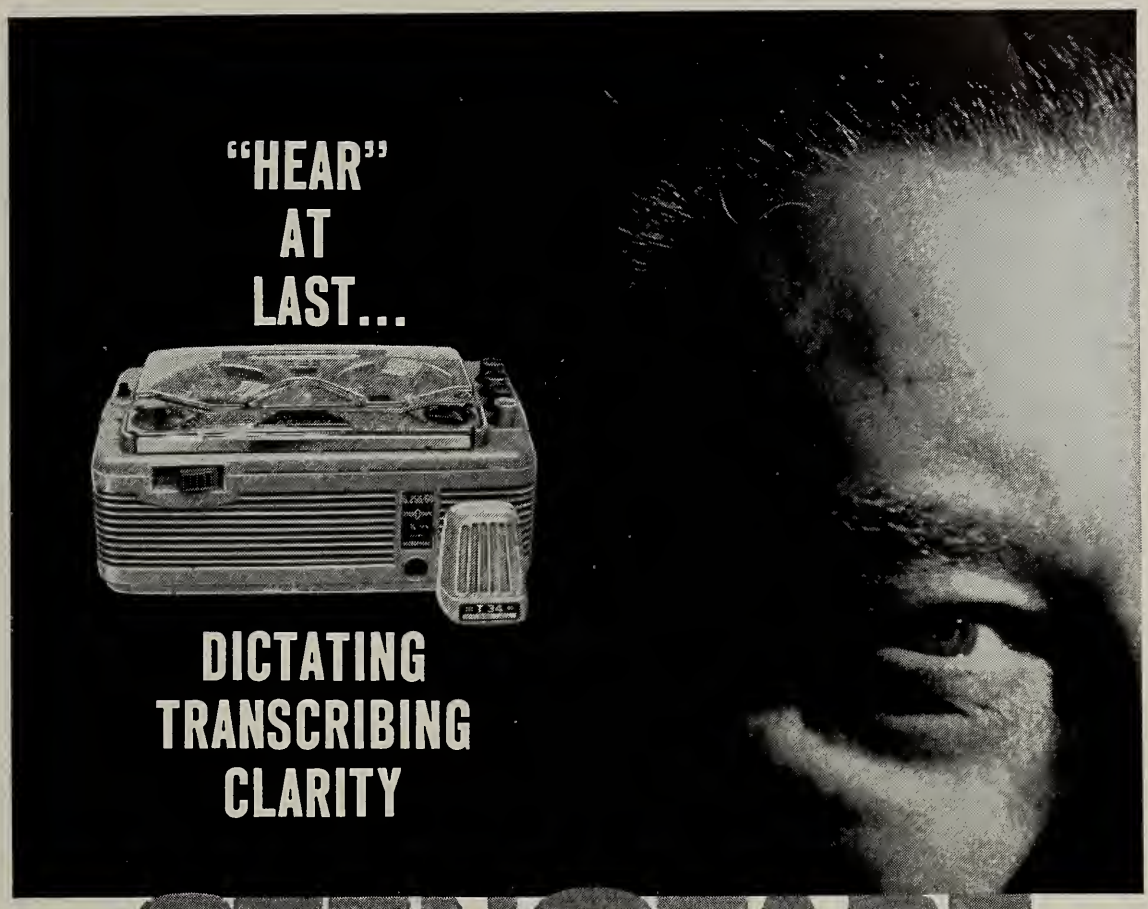
Ubel, Frank A.....St. Paul
Uhley, Charles G.....Crookston
Uihlein, Alfred.....Rochester
Ulrich, Emery E.....Crosby
† Ulrich, Henry L.....Minneapolis
Ulvestad, Harold S.....Minneapolis
Undem, Dale.....St. Cloud
Underdahl, Laurentius O.....Rochester
*†Undine, Clyde A.....Minneapolis
Urban, F. Henry.....Rochester
Utendorfer, Robert W.....Minneapolis
Utz, David C.....Rochester
Utz, Philip H.....LaCrescent

† Vadheim, Alfred L.....Brookings, S. D.
† Valentine, Walter H.....Tracy
Valgemae, Romil.....Minneapolis
Van Bergen, Frederick H.....Minneapolis
Van Cleve, Horatio P., Jr.....Austin
Vanderpool, Thomas E.....Paynesville
Vandersluis, Charles W.....Warren
Van Herik, Martin.....Rochester
Van Meier, Henry.....Stillwater
Van Puffelen, Paul S.....Duluth
Van Rooy, George T.....Thief River Falls
Van Ryzin, Donald J.....Duluth
Varco, Richard L.....St. Paul
Vaughan, Victor M.....Truman
Vaughn, C. Gordon.....St. Paul
Vaughn, Louis D.....Rochester
Veinbergs, Arnolds.....Minneapolis
Veirs, Dean M.....St. Paul
Veirs, Ruby J. S.....St. Paul
† Venables, Alexander E.....Unknown
Vennes, Jack A.....Minneapolis
Veranth, Leonard A.....St. Cloud
Verby, John E., Jr.....Rochester
Vezina, John C.....Mapleton
Vik, A. Elliott.....Minneapolis
Vik, Melvin.....Cambridge
‡ Viren, Fred K...Fairchild AFB, Wash., D.C.
Virnig, Hildegard J.....Caledonia
Virnig, Mark P.....Wells
Virnig, Richard P.....Wells
Vix, Vernon A.....Worthington
Vogel, Howard A. L.....New Ulm
† Vogel, Melvin D.....Rochester
Vollmer, Frederick J.....Winona
Von Drasek, Joseph.....Mankato
Von Drashek, Stanley C.....Minneapolis
† Von Heimburg, Roger L.....Rochester
Votel, Thomas W.....St. Paul

Waas, Charles W. A.....St. Paul
† Wagener, Henry P.....Rochester
Wagner, Norman W.....Benson
Wagner, Robert M.....Minneapolis
Wagoner, James M.....Casa Grande, Ariz.
Wahlquist, Harold F.....Minneapolis
Wakefield, Elmer G.....Springfield, Mo.
† Wakim, Khalil G.....Rochester
Walder, Harold J.....Duluth
Waldron, Carl W.....Hopkins
* Walfred, Karl A.....St. Cloud
* Walker, Alfred E.....St. Paul
Walker, Arthur E.....St. Paul
Wall, Carl R.....Minneapolis
Wall, James O.....St. Paul
Wallace, Helen M.....Washington, D. C.
Wallace, Martin O.....Duluth
† Waller, Joseph D.....Pine City
Wallinga, Jack.....St. Paul
Walonick, Albert L.....St. Louis Park
Walsh, Edward F.....St. Paul
Walsh, Francis M.....Minneapolis
Walsh, William T.....Minneapolis
Walter, Clarence W.....St. Paul
Walter, Frederick H.....International Falls
Walter, William E.....Wanamingo
† Walters, Edward W.....Rochester
Walters, Waltman.....Rochester
Wandke, Otto E.....Fairmont
Wangensteen, Owen H.....Minneapolis
Ward, Louis E.....Rochester
Ward, Percy A.....Minneapolis
Warner, James J.....Perham
Warren, Cecil A.....St. Paul
Wasmund, Clarence.....Red Wing
Wasson, Loren F.....Alexandria
Watkins, Charles H.....Rochester
Watkins, John A.....Wells
Watson, Alexander M.....Royalton
Watson, C. Gordon.....Minneapolis
Watson, Cecil J.....Minneapolis
Watson, John R.....Medford, Ore.
† Watson, Percy T.....Miami, Fla.
Watson, P. Theodore.....St. Paul
Watson, Robert M.....Morris
Watson, Robert N.....Detroit Lakes
Watson, Sidney W.....Royalton
Watson, Virgil A.....Detroit Lakes
Watson, William H. A.....St. Paul
Watson, William J.....Newport
Wattenberg, Lee W.....Minneapolis
Watz, Clarence E.....St. Paul
Waugh, John M.....Rochester
Weatherhead, Donald S. P.....Minneapolis
† Weaver, Myron M.....Schenectady, N. Y.
Weaver, Paul H.....Faribault
Weaver, Walt F.....Rochester
Webb, Alexander G., Jr.....Hoffman
Webb, Edgar A.....Minneapolis
Webber, Fred L.....St. Paul
Webber, Richard J.....St. Louis Park
† Weber, John C.....Rochester
Weber, Lowell W.....Minneapolis
Wedes, Deno J.....St. Paul
Weed, Lyle A.....Rochester
Weeks, Richard E.....Rochester
Weidman, William H.....Rochester
† Weinstein, Eugene C.....Rochester
† Weir, James F.....Rochester
Weir, Matthew J.....Virginia
Weis, Benjamin A.....St. Paul
Weisberg, Maurice.....St. Paul
Weisberg, Rapheal J.....Minneapolis
Weiss, Carl.....Hastings
Weisz, Samuel.....Rochester
Welch, John S.....Rochester
Wellman, William E.....Rochester
Wellner, Theodore O.....Rochester
Wells, Arthur H.....Duluth
Wells, Walter B.....Jackson
Wendland, John P.....Minneapolis
Wendt, H. Paul.....Thief River Falls
Wenner, Waldemar T.....St. Cloud
Wente, Harold A.....Rochester
† Wentworth, Albert J.....Mankato
Wenzel, Gilbert Paul.....St. Paul
Werner, George.....Minneapolis
Wesolowski, Stanley P.....Minneapolis
† West, Catherine C.....Minneapolis
† West, Robert J.....Rochester
Westby, Norval M.....Madison
† Westerman, Alvin E.....Montgomery
† Westerman, Fred C.....Montgomery
Westley, Kent F.....Little Falls
Westover, Darrell E.....St. Paul
Westrup, John E.....Lanesboro
Wetherby, Macnider.....Minneapolis
Wetteland, Thomas F.....West St. Paul
Wetzel, Earl V.....St. Paul
Wexler, Harold M.....Minneapolis
Weyhrauch, William R.....Rochester
† Wheeler, Daniel W.....Ft. Lauderdale, Fla.
Wheeler, Robert W.....Minneapolis
Whisnant, Jack Page.....Rochester
Whitacre, John C., II.....Minneapolis
† Whitaker, John J.....Rochester
Whitcomb, Fred F., Jr.....Rochester
White, Asher A.....Minneapolis
White, James C.....Rochester
White, Robert J.....Rochester
† White, S. Marx.....Minneapolis
White, Willard D.....Minneapolis
Whitman, Edwin J.....Rochester
Whitesell, Lloyd A.....Minneapolis
Whitson, Sidney A.....Albert Lea
Whittemore, Dexter D.....Bemidji
Widen, Wilford F.....Minneapolis
Wiener, Jerry M.....Rochester
Wikoff, Howard M.....Crookston
‡ Wilbur, Dwight L., III.....Camp Pendleton, Calif.
Wilbur, Oscar M., Jr.....Hibbing
Wilcox, G. Charles.....Albert Lea
Wild, John J.....Minneapolis
† Wilder, Kenneth W.....Minneapolis
† Wilder, Robert L.....Minneapolis
*†Wilder, Russell M.....Rochester
† Wilder, Russell M., Jr.....Topeka, Kans.
Wilder, Walter L.....Minneapolis
Wilken, Paul A.....Minneapolis
† Wilkowske, Rudolph J.....Owatonna
Will, Charles B.....International Falls
Will, W. W.....Bertha
† Williams, Arthur B.....St. Paul
Williams, Bruce F. P.....Duluth
† Williams, Charles A.....Seattle, Wash.
Williams, Clayton K.....St. Paul
Williams, George E.....St. Paul
Williams, Henry L.....Rochester
† Williams, Hugh O.....Lake Crystal
Williams, John A.....St. Paul
Williams, Mervyn M.....Ah-Gwah-Ching
Williams, Marland R.....Cannon Falls
Williams, Paul A.....Minneapolis
Williams, Richard A.....St. Paul Park
Williams, Richard E.....Robbinsdale
† Williams, Robert .....Unknown
Williamson, Harold A.....Fairmont
Wilmont, Cecil A.....Litchfield
Wilmont, Harold E.....Litchfield
† Wilson, Clyde E.....Blue Earth
Wilson, Fred B.....St. Paul
Wilson, J. Allen.....St. Paul
Wilson, James V.....St. Paul
Wilson, Louis J.....Winona
Wilson, Paul F.....Rochester
Wilson, Robert B.....Rochester
Wilson, Robert E.....Minneapolis
Wilson, Rolland H.....Winona
Wilson, Viktor O.....Rochester
Wilson, Warren E.....Northfield
Winchell, Paul.....Minneapolis
Winge, Herbert C.....Wheaton
Winkelmann, Richard K.....Rochester
† Winnick, Joseph B.....St. Paul
† Winter, John A.....Duluth
‡ Winter, Malcolm D., Jr...Miles City, Mont.
Winther, Nora M. C.....Minneapolis
Wipperman, Frederic F.....Minneapolis
Wise, James K.....Rochester
† Witham, Carl A.....Minneapolis
Witten, David M.....Rochester
Witter, Robert L.....Wadena
Witthaus, Melvin E.....St. Paul
† Wittich, Frederick W.....Minneapolis
Wittrock, Louis H.....Watkins
Wohlrabe, Arthur A.....Minneapolis
Wohlrabe, A. Cabot.....Minneapolis
Wohlrabe, Clarence F.....North Mankato
Wohlrabe, Donald E.....Springfield
Wohlrabe, Edwin J.....Springfield
Wohlrabe, John C.....North Mankato
Wolf, Alfred H.....Minneapolis
Wolff, John M.....Duluth
Wolkoff, Hyman J.....St. Paul
Wollaeger, Eric E.....Rochester
Wolter, Frederick H.....Minneapolis
† Woltman, Henry W.....Rochester
Wood, Lloyd T.....Rochester
Woodington, George F.....Rochester
Woodruff, Whitney.....Virginia
Woolner, Lewis B.....Rochester
Word, Harlan L.....St. Paul
Workman, Warner G.....Tracy
Worlton, James T., Jr.....Colorado Springs, Colo.
Worthington, John W., Jr.....Rochester
† Wovda, William C.....Minneapolis
Wright, Robert R.....Austin
Wright, Thomas D.....Minneapolis
Wright, Wale S.....Minneapolis
Wright, William S.....Edina
Wry, Paul E.....Rochester
† Wynne, Herbert M. N.....Minneapolis
Wynn, Kearney R.....Mankato

† Yadusky, Donald P.....Rochester
† Yaeger, Wilbert W.....Marshall
Yelle, Matthew D.....Anoka
Ylvisaker, Ragnvald S.....Minneapolis
† Yoerg, Otto W.....Minneapolis
Yoss, Robert E.....Rochester
Young, Henry H.....Rochester
Young, Thomas O.....Duluth
Younger, Lewis I.....Winona
Youngren, Everett R.....St. Paul
Yue, Wen Y.....Oak Terrace

Zachman, Albert H.....Melrose
Zachman, Leo L.....St. Paul
Zagaria, James F.....St. Paul
Zahrendt, O. Lewis.....Minneapolis
Zarling, V. Richard.....Minneapolis
Zaworski, Leo A.....Minneapolis
‡ Zeigler, Charles M.....Pine River
Zeleny, Joseph H.....St. Cloud
‡ Zeller, Nicholas H.....Unknown
Zemke, Erhart E.....Fairmont
Zemmers, Roberts .....Duluth
Zempel, Alan R.....Starbuck
Zierold, Arthur A.....Minneapolis
Zimmermann, Bernard M.....St. Paul
*†Zimmermann, Harry B.....St. Paul
Zinn, Charles W.....Elk River
Zinter, Ferdinand A.....Minneapolis
† Ziskin, Thomas .....Minneapolis
† Zitnik, Ralph S.....Rochester



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Communications

RETROLENTAL FIBROPLASIA AND OXYGEN THERAPY

The National Society for the Prevention of Blindness is receiving a number of inquiries regarding the relationship between oxygen therapy for premature infants and retrolental fibroplasia. Specifically, it is asked when the knowledge, that uncontrolled use of oxygen in the treatment of premature infants might result in retrolental fibroplasia, became generally available to the profession and hospitals.

Those who fail to follow recommendations established by competent authority for prescribing oxygen for premature infants subject their patients to the risk of blindness.

The entire medical profession and all hospital administrators have a duty to institute and persistently follow procedures in the administration of oxygen to premature infants that will prevent retrolental fibroplasia.

An annotated bibliography on the relationship of oxygen therapy to retrolental fibroplasia will be furnished on request. These references are set out in chronological order to show when it was that knowledge of the cause and prevention of RLF became available to the medical profession.

John W. Ferree, M.D.
National Society for Prevention of Blindness
New York, N. Y.
April 18, 1960

AN OPEN LETTER

Dear Dr. Carey:

Yesterday I listened to your vilification of the American Medical Association. Along with Senator Dirksen, I wondered how you ever got elected to your present position.

Let me call your attention to a few things you overlooked. Congress, regardless of the party in power, has never been able to get a compulsory health insurance bill out of committee for a floor vote *in either House.* Opposition within the Democratic Party has been strong, though you act as though only Republicans stood in the way of the program you espouse. *Senator Murray himself in 1945-46, when the Democrats were in power, did not report out his own bill from the Labor Committee.* This year in the Ways and Means Committee 7 Democrats voted against the Forand bill along with 10 Republicans.

The reason for opposition is clear. *The American people do not want State Medicine.* They have opposed the medical care systems of Russia and Great Britain. Intelligent people know that the nationalization of medicine would destroy the private practice of medicine.

You ask if the Social Security Act is socialistic. *It most assuredly is!* What else? The Forand bill is pure Socialism. If you weren't so ignorant you would know that the social security program in every country where it is in operation serves as the mechanism for Socialist control over the individual. Social Security is the foundation, the cornerstone, and the superstructure of the Welfare State. As Senator Dirksen said: *"You* like compulsion." Like the Senator, *I don't!*

Most of the old people about whom you claim to be so concerned wouldn't even be alive today if it weren't for the medical profession. Medical fees have risen along the present inflationary trend for which labor is so largely responsible. Hospital costs have gone up excessively because, in part at least, labor has put a higher price tag on all hospital non-medical services and on everything from bricks to steel and sheets to surgical instruments. Labor's demands have been excessive and selfish. You boost the cost of hospitalization and then yell about the results of your own handiwork.

Someone ought to *compel* you to apologize to the American Medical Association which is the professional organization to which most of the practicing physicians of the country belong. You are fully aware of the fact that the AMA has been meeting with citizen groups all over the United States in an effort to help solve the medical care problems of the aged. If organized labor were to give even a small fraction of the thought, time, money, and services that organized medicine has given to the aged of this country, there might be some hope of solving the complex problems involved. It would be an excellent idea if you were to shut up until you knew what you were talking about. Your colossal ignorance is matched only by your insolence.

Sincerely,
Marjorie Shearon
Editor, *Challenge to Socialism*

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

SCHOLARSHIPS FOR MEDICAL STUDENTS

The Montgomery County Medical Society, of Southeastern Pennsylvania, has launched a program of scholarships for medical students. This is hoped to be the beginning of a wide-spread attempt, by physicians, to reverse the rapid decline of both quality and quantity of applicants for medical schools.

Alarmed by well-documented reports from leaders of medical education, the Society did a committee study of

(Continued on Page A-60)



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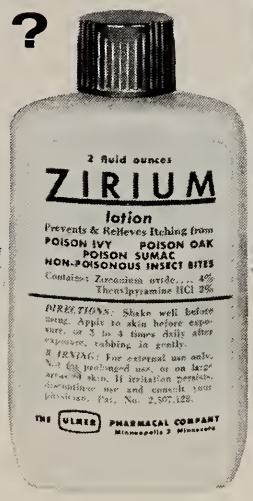
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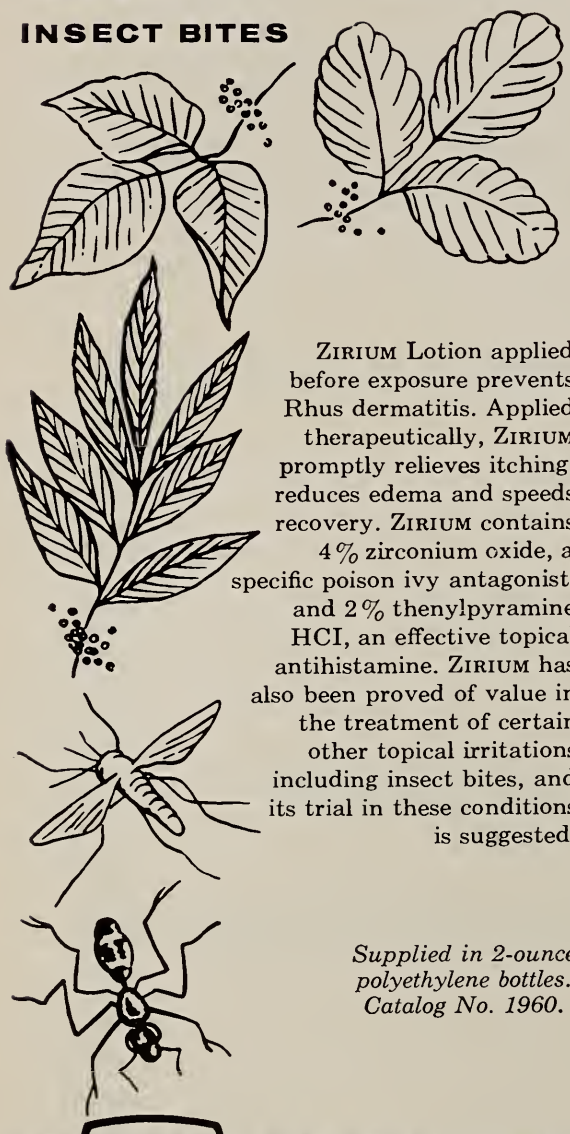
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(Continued from Page A-58)

the situation. It was found that the decline in medical school candidates had reached a serious level. Contrary to general belief, there are only 1.87 applicants for every seat in medical school freshman classes. The pleasant fiction that there are nine or ten applicants for each medical school opening has not been true for thirty years.

In addition the number of "A" students applying to medical schools has dropped off sharply. This trend is also shown in the recent rise in medical school flunk-outs. Academic casualties were 3.4 per cent in 1954-55, 5.6 per cent three years later.

The obvious conclusion, to the committee, was that medicine no longer is getting its share of first-class brains in its schools.

The causes of this problem were multiple. High cost of medical study, length of time needed for training, lack of scholarship funds, high marriage rate among college students, and intense competition from other professional fields.

Analysis of the temporary increase in applicants following World War II, confirmed the opinion that if money is available, the good college student is still interested in studying medicine.

BRUCE H. CARNEY, M.D.
Editor, *Bulletin of Montgomery County Medical Society*

MISREPRESENTATIONS

American Registry of Doctor's Nurse, 1366 National Press Bldg., Washington, D. C., has been charged by the Federal Trade Commission with misrepresenting that it is a non-profit organization, and with giving customers the means to misrepresent themselves as registered, graduate or licensed nurses.

Ralph Z. Bell, Robert L. S. and Evelyn W. Bickford, and Phillip Sellers, the concern's officials, also are cited in the FTC's complaint.

The respondents sell memberships in the organization, insurance policies, certificates, pins, emblems, and other insignia and indicia to persons employed in doctors' offices.

FEDERAL TRADE COMMISSION

ONE-HAND TALKING CHART

In January, 1943, I was stricken by coronary thrombosis followed by cerebral embolism, which resulted in right hemiplegia and complete aphasia. It was then, by using my left hand, that I devised twenty hand signs that became a universal one-hand manual language, well known as the "Hand Talking Chart" which has proven to be a practical clinical aid. With the chart, aphasia patients impart their basic needs and desires, thus dispelling their fears and helping them to a "come back."

During the last twelve years, the chart has been supplied without charge to physicians and nurses through the kind cooperation of medical editors, nationally and internationally.

In 1954, the "International Research Council" was chartered as a world-wide medical confraternity for the dissemination of knowledge concerning aphasia associated with hemiplegia. The aims of the Council include: (1) establishment of a clearing house on this specialized subject—library data, medical books, publications, and reprints of articles written by Council members; (2) the continuance of free distribution of the "Hand Talking Chart."*

*For a free copy of the chart write direct to Hamilton Cameron, M.D., 601 West 110th Street, Rm. 3-LL, New York 25.—Ed.

Sincerely,
HAMILTON CAMERON, M.D.

New York, N. Y.
April 21, 1960

PUBLIC HEALTH SERVICE OFFERS NURSING RESEARCH GRANTS

The Public Health Service has announced four new grants totaling $137,616 for research in nursing. The new awards bring to seventy-seven the number of extramural projects which have been supported since the Nursing Research Grants program was established in 1955. The investment to improve patient care through research in nursing now exceeds $3,000,000.

The new awards are for studies in the areas of psychiatric nursing, public health nursing, behavioral science, and chronic illness.

More detailed information about the Research Grants program may be obtained from the Division of Nursing Resources, Public Health Service, Department of Health, Education and Welfare, Washington 25, D. C.

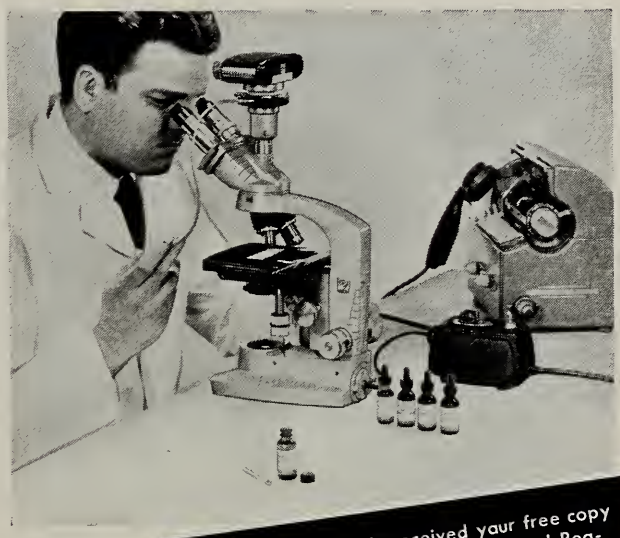
The death rate from TB is not dropping as fast as it was. Today, TB accounts for more deaths than all other infectious diseases combined.

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Meetings and Announcements

INTERNATIONAL

Sixth International Congress of Internal Medicine, August 24-27, 1960, Basle, Switzerland; organized by the International Society of Internal Medicine, President, Sir Russell Brain, F.A.C.P. Hon., London, England. Registrations should reach the Secretary, Professor Doctor H. Ludwig, Basle, Switzerland, as soon as possible.

* * *

The first Congress of the Asia-Pacific Academy of Ophthalmology will be held in Manila, Philippines, October 10-13, 1960, under the sponsorship of the Philippine Ophthalmological Society. For registration or further particulars, please write to Doctor Jesus V. Tamesis, Executive Chairman, 42 Quezon Boulevard, Quezon City, Philippines.

* * *

The XIVth General Assembly of the World Medical Association and the Sixty-Third Deutsche Arztetag will convene in West Berlin, Germany, September 15-22, 1960.

* * *

The Third International Congress of Physical Medicine, August 21-26, 1960 at the Hotel Mayflower, Washington, D. C.

* * *

The Fifth International Poliomyelitis Conference will be held July 26-28, 1960, in Copenhagen, Denmark, under the sponsorship of the National Foundation and the Danish Infantile Paralysis Association. For further information concerning the conference, write to Mr. Stanley E. Henwood, Executive Secretary, International Poliomyelitis Congress, 120 Broadway, New York 5, New York.

NATIONAL

The Fourteenth Annual Rocky Mountain Cancer Conference, July 20-21, 1960, Denver Hilton Hotel, Denver, Colorado.

* * *

The Thirteenth Annual Conference on Electrical Techniques in Medicine and Biology, October 31-November 2, 1960, Sheraton-Park Hotel, Washington, D. C. For further information on conference write to Lewis Winner, 152 West 42nd Street, New York 36, New York.

* * *

The 1960 Postgraduate Calendar of the University of Colorado Medical Center, Denver, Colorado, is: July 5-8, Ophthalmology (Aspen, Colorado); July 21-23, Dermatology for General Practitioners; August 9-12, Medical Statistics for the Clinician "What Numbers Can You Believe?"; August 15, Cardiopulmonary Disease Seminar; August 16-19, Western Cardiac Conference; September 1-6, Pediatrics (Estes Park, Colorado) and November 3-5, Fractures. For further information and detailed programs write to The Office of Postgraduate Medical Education, University of Colorado Medical Center, 4200 East Ninth Avenue, Denver 20, Colorado.

* * *

The Sixty-Seventh Annual Convention of the Association of Military Surgeons of the United States, October 31-November 2, 1960, Mayflower Hotel, Washington, D. C.

* * *

The New York University Post-Graduate Medical School offers a series of two-week summer courses in prosthetics in cooperation with the International Society for the Welfare of Cripples constituting the Third International Prosthetics Course sponsored by the Committee on Prosthesis, Braces and Technical Aids of the ISWC, August 15-26, 1960. For applications and further information, write: Doctor Sidney Fishman, Director, Prosthetics Education, New York University Post-Graduate Medical School, 342 East 26th Street, New York 10, New York.

* * *

The National Foundation offers the following post-doctoral fellowships: Research Fellowships, for candidates who are preparing for careers in scientific research and/or academic medicine; Clinical Fellowships, Arthritis and Related Diseases, for clinical study in arthritis and related diseases; Orthopedics, for advanced study in that specialty; Preventive Medicine, for physicians for study and research in the training of preventive medicine, and Rehabilitation, for physicians interested in rehabilitation. For further information write to the National Foundation, 800 Second Avenue, New York 17, New York.

* * *

Fourth National Cancer Conference, University of Minnesota, Minneapolis, Minnesota, September 13-15, 1960. Sponsored by the American Cancer Society, Inc.

* * *

STATE

The Crippled Children Services is sponsoring an Orthopedic Clinic for Crippled Children in the Morris, Minnesota, area. Children from Swift and Stevens Counties may go to the Morris High School, Morris, Minnesota.

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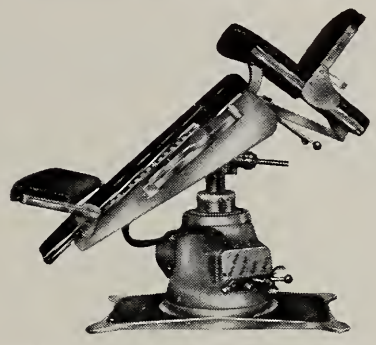
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The Physician's Diary

Dr. Richard C. Lillehei, University of Minnesota Medical School, has been named a Markle scholar in Medical Science by the John and Mary R. Markle Foundation of New York. The appointment includes a $30,000 grant to the medical school, which will use it to pay Lillehei supplemental support funds and to aid his research for the next five years.

* * *

The East Range Clinic at Eveleth has announced the appointment of **Dr. D. W. Davies** to the staff. Doctor Davies formerly practiced in Harvey, North Dakota.

* * *

Members of the Hennepin County Medical Society recently heard a panel discuss the relationship between emotions and heart disease. Participating were **Dr. Jesse Barron,** Minneapolis, Moderator; **Dr. Thomas W. Martingly,** President Eisenhower's medical consultant; **Dr. Ralph Rossen,** Director of the L. E. Phillips Psychobiological Research Foundation, Minneapolis; **Dr. Milton W. Anderson,** Mayo Clinic; and **Dr. Richard M. Steinhiber,** Mayo Clinic.

* * *

The new president of the Stearns-Benton Medical Society is **Dr. L. H. Wittrock** of Watkins.

* * *

Dr. T. M. Hanson, Albert Lea, has received word of his election to membership in the American Academy of Allergy. The American Academy of Allergy is an association of physicians interested in the care of patients with allergies, such as hay fever, asthma, some migraine headaches and some of the skin disorders.

* * *

Members of the hospital staff in Redwood Falls honored **Dr. W. A. Brand,** Redwood Falls, on his eighty-fourth birthday.

* * *

Dr. Robert J. Meyer, health officer for Golden Valley, announced that he is moving to Bethany, Oklahoma, where he will continue in medical practice. Doctor Meyer has been in Golden Valley since 1954. **Dr. Stanley Stone** and **Dr. Wallace Anderson** have taken over Doctor Meyer's practice.

* * *

The Karlstad Hospital staff will have an addition next fall, when **Dr. Duane Pansegrau,** formerly of Sioux City, Iowa, joins the group.

* * *

Doctors Lillian and Katherine Nye were awarded Honorary Life Memberships in the St. Paul YWCA at the annual meeting of that organization held April 25, at the YWCA Auditorium. The award was presented for extraordinary service and commitment. Dr. Katherine Nye has served as a member and examining physician since 1915 and Dr. Lillian Nye since 1921.

Dr. C. W. Mayo, Mayo Clinic, was the guest speaker at the annual meeting of the New Ulm Chamber of Commerce, May 2, in New Ulm.

* * *

The Virginia Municipal Hospital staff has elected **Dr. Hershel B. Cope** as Chairman of the Staff. Doctor Cope succeeds **Dr. L. K. McGill** as Chief of Staff. Other officers elected were **Dr. R. E. Payne,** East Range Clinic, Vice Chief of Staff; and **Dr. I. M. Prlina,** East Range Clinic, Secretary-Treasurer.

* * *

Dr. John C. Mickelson, urologist at the Mankato Clinic, was recently certified by the American Board of Urology. Doctor Mickelson is also a member of the American College of Surgeons.

* * *

Dr. Robert Cullen, who has practiced medicine in Wells for the past year and a half, has left on a speaking tour through southern and eastern states. Doctor Cullen was previously a missionary medical doctor in French Equatorial Africa.

* * *

Worthington physician, **Dr. R. W. Robinett,** has resigned his position on the Southwest Minnesota Mental Health Board, which administers the Tri-County Mental Health Center at Luverne. Doctor Robinett left early this month to assume duties with the University of Michigan Hospital at Ann Arbor.

* * *

The *Hibbing Daily Tribune* of April 22 featured an article by **Dr. Donald Nollet** regarding the fight against cancer. The article was in connection with the Cancer Control Month program for April.

* * *

Dr. George B. Eusterman received a high award, April 6, from the American College of Physicians in San Francisco. Doctor Eusterman was among five physicians to be made a Master of the College. He was selected by the Board of Regents of the College last November for the award for his "high accomplishments in internal medicine."

* * *

The medical staff of St. John's Hospital, St. Paul, held its annual spring formal dinner in the Town and Country Club, St. Paul. Co-chairmen were **Dr. Barnard Hall** and **Dr. Charles Beck.** Sponsors were **Dr. and Mrs. Gordon Strate and Dr. and Mrs. Donovan McCain.**

* * *

Dr. Robert B. Wilson, Mayo Clinic, was elected president of the American Society for the Study of Sterility at the 16th annual meeting of the group in Cincinnati, Ohio. The society was founded in 1944 to encourage study of the clinical aspects of infertility. Doctor Wilson will be installed as President at the 1961 meeting.

Dr. Paul G. Belau, Blue Earth, is one of eight physicians recently appointed to Fellowship at the Mayo Clinic in Rochester. His specialty will be diseases of the eye and eye surgery.

* * *

One of six American doctors who participated in the 27th Congress of Surgeons of the U.S.S.R. which was held May 23-28, in Moscow, Russia, was **Dr. Waltman Walters,** of the Mayo Clinic. Doctor Walters and his wife spent one month in Russia, touring cities and visiting hospitals, clinics, medical and surgical centers and research institutes. Previous to his visit to Russia, Doctor Walters attended the Pan-American Medical Association meeting in Mexico City, where he presented two papers.

* * *

Drs. Harry L. Berge, Edgar C. Burseth and **Willard F. Nordman,** Mora physicians, have announced that the Mora Clinic has moved to its new location on Park Street.

* * *

The Director of the Fort Snelling Veterans Administration Area Medical Office, **Dr. Oreon K. Timm,** has been appointed Deputy to the Assistant Medical Director for VA operations in Washington, D. C. Doctor Timm succeeds Dr. H. B. Cupp in the position.

* * *

Dr. Philip S. Hench, Mayo Clinic, was presented a new award by the American College of Physicians at its annual meeting in San Francisco. The award in the form of a medal, was presented to Doctor Hench for his discovery of the effectiveness of the steriod hormones in the treatment of inflammatory disorders.

* * *

An open house for **Dr. Fouad Sukkar,** Fulda, was held early in April to acquaint Fulda and area residents with Doctor Sukkar and the Clinic.

* * *

An estimated fifty doctors and their wives recently heard **Dr. John Grotting** speak on plastic surgery and **Dr. Joseph Cella** speak on problems of bleeding and hemorrhagic diseases. Doctors Grotting and Cella are from Grand Rapids. The event was the Spring Seminar of the Range Chapter of the American Academy of General Practice.

* * *

Dr. J. A. Cosgriff, Sr., Olivia, has announced the winners in the State Essay Contest sponsored by the American Physicians and Surgeons Association. Doctor Cosgriff also served as one of three judges for the state contest.

* * *

St. Paul physician, **Dr. A. E. Ritt** and his wife, visited the French Riviera, Paris, Italy, Switzerland and England this spring after attending a medical convention in Philadelphia.

* * *

Fort Lauderdale, Florida, was the scene of a Postgraduate Medical Refresher Course on "Mediclinics of Minnesota" which **Dr. Louis H. Wittrock,** Watkins, attended.

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Dr. J. V. Ross, Jr., Rochester, has been appointed to the position of staff assistant at the Mayo Clinic. Doctor Ross is specializing in Internal Medicine.

* * *

Dr. Leo J. Kanner, University of Minnesota visiting professor of child psychiatry, has been named recipient of the first annual award of the National Organization for Mentally Ill Children, Inc., according to Robert P. Marcus, organization president. The award, given for "significant contributions to understanding of childhood mental illness," was presented to Doctor Kanner at a dinner in his honor May 17, in New York City's Hotel Plaza.

* * *

Dr. Hugh R. Butt, head of a section of medicine in the Mayo Clinic, Rochester, and Professor of Medicine in the Mayo Foundation, Graduate School, University of Minnesota, was installed as president of the American Gastroenterological Association at the sixty-first annual meeting of that organization in New Orleans, Louisiana. Doctor Butt was elected to the presidency at the 1959 meeting of the Association in Atlantic City, New Jersey.

* * *

Dr. J. Arnold Bolz, Grand Rapids, has recently completed a book on a partial history of Minnesota's canoe country. His book, "Portage into the Past" will be published by the University Press this fall.

* * *

St. Paul physician, **Dr. Gordon R. Kamman**, addressed a meeting of the American Board of Legal Medicine at Cleveland, Ohio, April 1. Doctor Kamman's topic was "Sex Psychopath Laws and Related Subjects."

* * *

The East Range Clinics, Virginia, announce that **Dr. I. M. Prlina** has been certified by the American Board of Urology following a trip to Chicago for completion of Part II of the American Board examination.

* * *

Dr. George D. Molnar, Mayo Clinic, was guest speaker at a meeting of the Rochester Dietetic Association at St. Mary's Hospital in Rochester. Doctor Molnar spoke on recent studies on the management of diabetes mellitus.

* * *

The *Rochester Post-Bulletin* recently printed an article by the Mayo Clinic reporting registration figures. The report stated that total registration at the Mayo Clinic as of April 2, 1960, was down 772 from a year ago. However, administration sees no reason why registration figures may not improve in the coming months.

* * *

Dr. A. C. Forsland, Virginia, has moved into new offices located on 9th Street North in Virginia in the Northgate Plaza. Doctor Forsland held an open house in April for residents of that area to see the new offices.

* * *

President of the Minnesota Medical Foundation, **Dr. Herman E. Drill**, Hopkins, has announced that the Foundation has begun accepting applications for its 1960 scholarship program. Awards of $500 each are

made annually to medical students on the basis of scholastic performance and financial need. The awards are financed by private contributions of individuals, businesses and organizations and are administered through the Foundation.

* * *

The *Wabasso Standard* carried a feature article on April 14, 1960, concerning Wabasso's physician, **Dr. William Alcorn.**

* * *

Dr. Frank Kiesler, Minneapolis, has been named psychiatrist and program director of the Tri-County Mental Health Center at Grand Rapids. Doctor Kiesler will start his duties in early July.

* * *

The Hennepin County Multiple Sclerosis Chapter has named **Dr. Maynard Cohen** as chairman of the Medical Advisory Committee. Doctor Cohen is a University of Minnesota Hospital Research Neurologist.

* * *

Reelection of officers of the Northern Association for Medical Education has been announced. Reelected officers are **Dr. Davitt Felder,** President; **Dr. Edward Burch,** Vice President; **Dr. Ian A. Brown,** Secretary, and **Dr. Ben Sommers,** Treasurer. John W. Hedback, new Executive Director of N.A.M.E., was introduced to the Board at the meeting. Members of the Board are the elected officers and **Drs. Robert W. Holmen, Jane E. Hodgson, Albert E. Ritt, Charles C. Cooper, Milton Hurwitz, Gilbert P. Wenzel, Wallace P. Ritchie, John B. Coleman and Delmar R. Gillespie.**

St. Paul surgeon, **Dr. Robert Flom,** recently conducted a "Demonstration of Cardiac Arrests" at a seminar for post-graduate students of the Southwestern Minnesota Academy of General Practice. **Dr. E. A. Kilbride,** Worthington, President and **Dr. D. E. Nealy,** Adrian, Secretary, were in charge of arrangements for the seminar.

* * *

Dr. and Mrs. J. C. Cain, Rochester, have just returned from Europe where Doctor Cain presented a paper at the Sixth Congress of The European and Mediterranean Societies of Gastroenterology in Leiden, The Netherlands. The Cains also visited Belgium, France, Germany, Spain, England and Switzerland.

* * *

The Fridley, Minnesota, Council has announced that **Dr. Earl W. Eli,** Minneapolis, has resigned as Fridley Public Health Officer. Doctor Eli stated his resignation was due to the press of business.

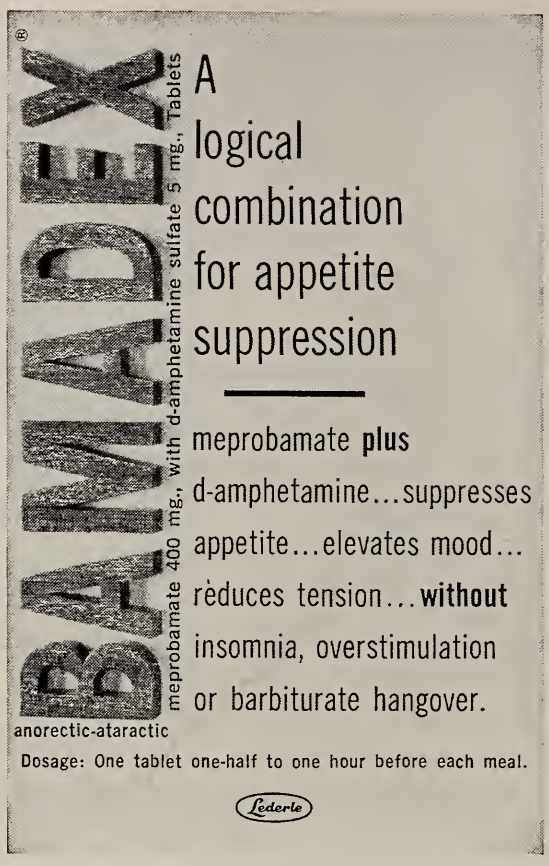
* * *

The section of neurologic surgery of the Mayo Clinic and the Mayo Association have announced the establishment of the Craig Memorial Neurosurgical Travel Award in honor of the former chief of the section, the late **Dr. Winchell McK. Craig.**

* * *

Forest Lake physicians, **Drs. G. T. Midboe** and **J. L. Purdie,** have moved into the new Doctors Clinic. The new building is located at 121 S. E. 11th Avenue, opposite the new hospital site.





Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

COLD INJURY, GROUND TYPE. By Tom F. Whayne, MC, USA (Ret.) and Michael E. Debakey, M.W. (U. S. Army. Surgeon General's Office. The Medical Department of the U. S. Army in World War II. Part 4) 570 pages. Illus. Washington, D. C.: Government Printing Office, 1958. Price, $6.25.

This volume is a remarkably frank discussion of the problem of trench foot, frostbite, chilblains and shelter leg as experienced in World War II. Historical data concerning cold injury is extensive and begins with Larrey's observations in the Napoleonic Wars. The errors of command in not training the combat soldier to care for his feet and in not providing the proper protective equipment are frankly pointed out. This discussion of the care and treatment of cold injury is excellent but most important is the great emphasis placed on the fact that the only treatment of worth is proper prophylaxis. It is hoped that this volume will serve as a useful guide for persons who may be subjected to conditions similar to those found in battle in cold climates. Physicians who deal with vascular disease problems will find this volume of great value. F.M.O.

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Fibrous Tumors of the Soft Tissues

ARTHUR PURDY STOUT, M.D.
New York, New York

From the Laboratory of Surgical Pathology, Columbia University, New York, New York.

Read at the Sectional Meeting, American College of Surgeons, Minneapolis, Minnesota, April 13, 1960.

ONE MIGHT suppose that tumors composed of fibrous tissue should be easy to recognize, should be easily divisible into benign and malignant, and their behavior easy to predict and to deal with. Actually, they are not so easy to identify and are a frequent source of error and confusion. One important reason for this confusion stems from the fact that it is common to suppose that a fibroblast is a simple cell that makes connective tissue fibers and is derived from a pre-existing fixed connective tissue called a fibrocyte. This is not necessarily the case, for there are a number of different cell types that are facultative fibroblasts. For example, it has been proved that Schwann cells, reticulum cells, histiocytes and mesothelial cells are all capable of acting as fibroblasts by producing reticulin and collagen and temporarily abandoning their proper functions.[3,9] A variety of other cells in tumors such as lipoblasts, rhabdomyoblasts and synovioblasts, by exercising their ability to function as fibroblasts, can produce tumors that may easily be mistaken for fibrosarcomas.[9] This might not be serious were it not for the fact that the malignant tumors formed by these facultative fibroblasts actually do not behave biologically like fibrosarcomas but like malignant mesotheliomas, rhabdomyosarcomas, liposarcomas et cetera, depending upon the variety of cell masquerading as a fibroblast. Each one of these malignant tumors has its own peculiarities of behavior and may be quite different one from the

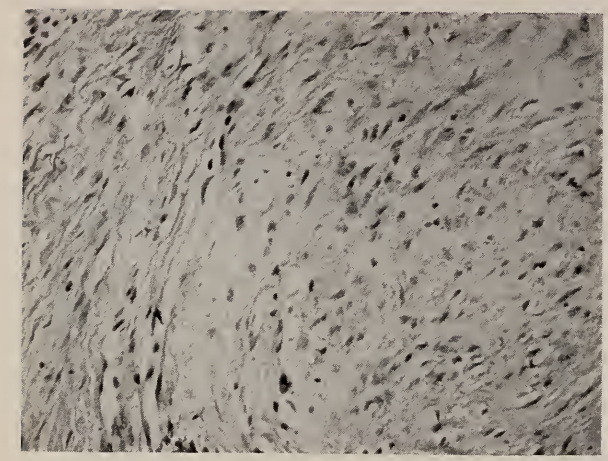


Fig. 1. Fibromatosis of the popliteal space in a child. X200.

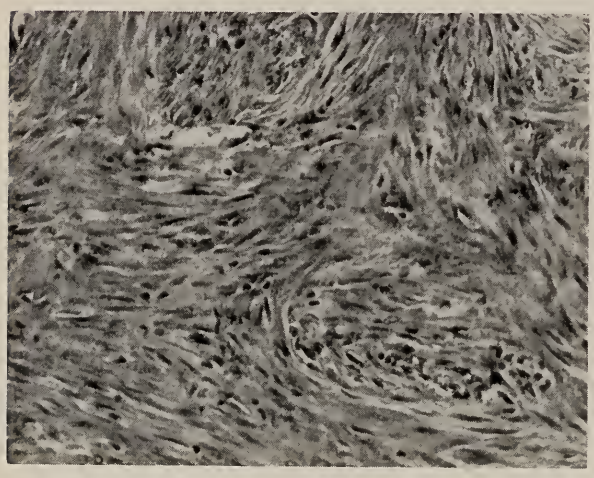


Fig. 2. Fibromatosis or differentiated fibrosarcoma of the arm in a child. A recurrence was excised after four months. Well fifty-three months later. X200.

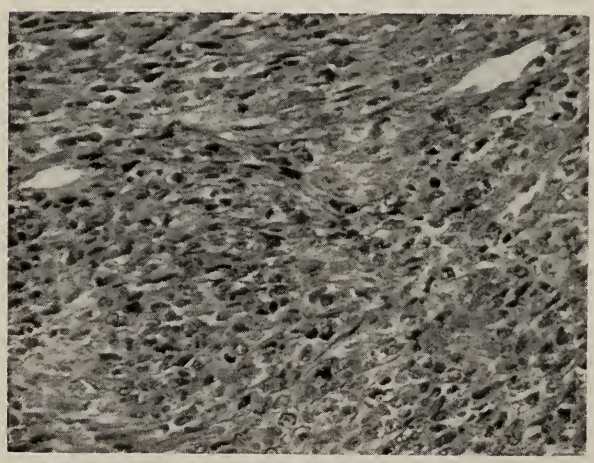


Fig. 3. Malignant fibrosarcoma in trapezius muscle of 14-months old child. Recurred and metastasized to lungs. X200.

other and from the true fibrosarcoma derived from honest fibroblasts. This phase of the problem is further complicated by the fact that sometimes cells of mesenchymal derivation seem to be unable to control their atavistic tendency so that they may form a single tumor composed of several different kinds of tumor types. There are both benign and malignant mixed mesenchymal tumor types that are called mesenchymomas and are most confusing to one not familiar with these potentialities.[9]

Another potent source of error and confusion derives from the fact that the term fibrosarcoma is often applied indiscriminately to both benign and malignant tumors. In a large majority of cases, the fibrosarcoma does not metastasize and is only worthy of the name because it is apt to infiltrate insidiously and therefore often recurs following incomplete removal. If this persisting infiltrative growth happens to occur in a part of the body where there are structures which cannot be sacrificed with impunity, the result may be loss of an extremity or even life itself; but this is not really an evidence of malignancy, but rather neglect on the part of the patient, or inadequate treatment on the part of the surgeon, or both. In 1948, when I published a paper dealing with fibrosarcomas,[8] I thought the term fibrosarcoma ought to be retained for these non-metastasizing tumors because our recurrence rate at that time was 63 per cent. But later I became convinced that one should attempt to apply the term of fibrosarcoma solely to the truly malignant tumors that commonly are capable of metastases. At the present time, therefore, most often I use the term fibromatosis[10] instead of fibrosarcoma for such lesions as dermatofibrosarcoma and others like it in the skin and elsewhere. This eliminates the term fibrosarcoma for many benign tumors. However, there are some tumors that are so cellular that one hesitates to exonerate them entirely. These are well differentiated, even though very cellular, in that they form many connective tissue fibers. For these I still use the term fibrosarcoma but qualify it by the descriptive word "differentiated" and explain that while it is remotely possible such a tumor might metastasize one need not greatly fear it. This leaves the term undifferentiated fibrosarcoma for the truly malignant fibrous neoplasms that often metastasize.

But not all sources of diagnostic confusion have been covered. The single or multinodular tumor that develops in the corium and often involves the subcutaneous tissues as well is not always a simple

fibrous growth. Sometimes it has a considerable vascular element and has phagocytic histiocytes intermingled. For such tumors, Gross and Wolbach[4] suggested the name sclerosing hemangioma disregarding the histiocytes as incidental. Others have felt that the histiocytes should not be regarded as incidental and use the term fibrous xanthoma for such tumors.[9] The issue has been further confused when it has also been suggested that some of these tumors are neurofibromas.[1] Clinically, such growths may be indistinguishable from the so-called dermatofibrosarcoma protuberans which in my opinion is a fibromatosis, or from the rare sweat gland carcinoma. But it is of some importance to make an exact histological interpretation for both the sweat gland carcinoma and the fibrous xanthoma very occasionally will metastasize while the dermatofibrosarcoma (that is, fibromatosis) scarcely ever does.

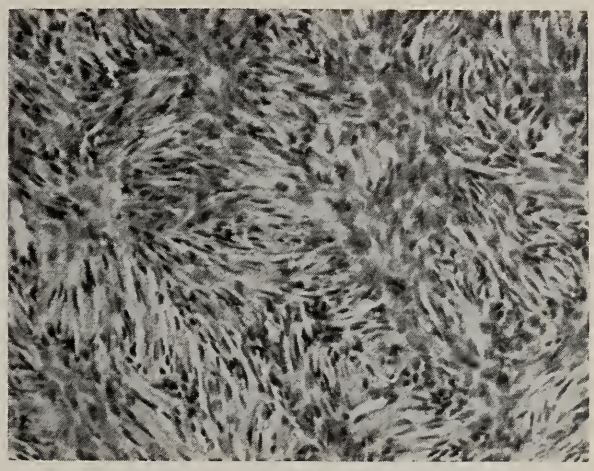


Fig. 4. Fibrous xanthoma of chest wall. The peculiar spiral nebular pattern is characteristic. Sometimes called dermatofibrosarcoma protuberans. X200.

In recent years, another fibrous growth has been recognized which, due to misinterpretation, has led a great many pathologists into the error of calling a benign lesion malignant, resulting in unnecessary operations. This is the so-called pseudosarcomatous fasciitis.[2,5,7] This fascinating lesion, first accurately described by Konwaler, Keasbey and Kaplan[5] in 1955, appears to be a relatively recent development, for I have been unable to find such cases in our files prior to 1948; yet at the end of 1959, we have records of seventy-seven cases, thirty of which came to us in 1959. The information concerning these patients is shown in Tables I to IV. Briefly, the lesion appears suddenly, and usually unheralded, as a rapidly growing subcutaneous lump that may be painful or tender. Probably because of the sudden appearance and rapid growth, the patient seeks early relief and the surgeon removes it. Then the trouble begins, for often an unwary pathologist calls it a malignant tumor. I can easily understand this, for I did the same thing before I learned to recognize the lesion. The growths, which seldom reach a large size, are generally adherent to the deep fascia and are composed of a peculiar mixture of fibroblastic tissue with areas of capillary proliferation, sometimes fat necrosis and a very variable number of inflammatory cells. Actually, the lesion appears to be some kind of a granuloma with a bizarre cellular proliferation that has variously been called fibrosarcoma, liposarcoma, Kaposi's sarcoma, cystosarcoma phyllodes and sarcoma of undetermined type. Fortunately these diagnoses have not led to any amputations as far

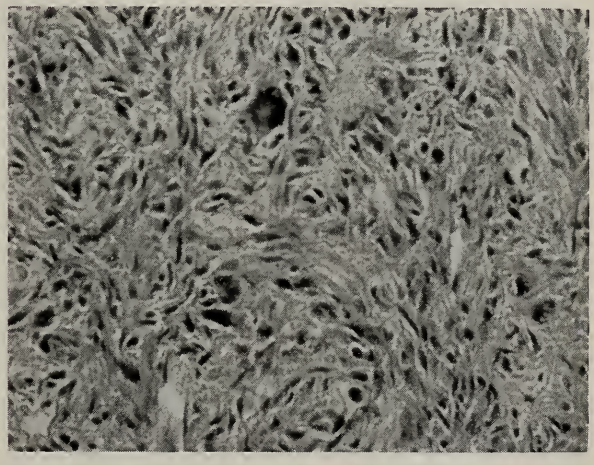


Fig. 5. Fibrous part of a liposarcoma. The pyknotic giant cells betray the nature of the growth. X200.



Fig. 6. Pseudosarcomatous fasciitis. This benign granulomatous lesion was called erroneously a synovial sarcoma. X200.

as I am aware, but there have been a number of unnecessary reexcisions of the wound. I know of no case that has metastasized, and of only five that have had recurrences.

TABLE I.
SEVENTY-SEVEN CASES OF FASCIITIS
1948 to 1959 Included

Upper extremity		35
Arm	12	
Forearm	23	
Lower extremity		18
Thigh	12	
Leg	5	
Foot	1	
Trunk		14
Head and neck		6
Vulva		1
Female breast		2
Trachea		1

In former years, the tumors called fibrosarcomas gained a very evil reputation due to the large number that was reported to have metastasized and killed. I have indicated that almost any cell of

TABLE II.
SEVENTY-SEVEN CASES OF FASCIITIS
1948 to 1959 Included

Age	
5 months to 10 years	4
11-15 years	7
16-20	2
21-30	17
31-40	12
41-50	9
51-79	22
Age unknown	4
Sex	
Female	37
Male	39
Unknown	1
Size in centimeters	
3.5 cm. or less	58
4 to 10.5 cm.	3
Not stated	16

mesenchymal origin is a facultative fibroblast, and that many other sarcomas of different cellular derivation may be called fibrosarcoma if one chooses to ignore the evidences of their true cellular origin

TABLE III.
SEVENTY-SEVEN CASES OF FASCIITIS
1948 to 1959 Included

Duration of symptoms	
1 month or less	28
1 to 3 months	21
Over 3 months	10
Unknown	18
Pain or tenderness	
Positive	20
Negative	8
Not stated	49

which are not hard to identify if one is familiar with them.[9] These features are now reasonably well known to pathologists, and they are much more careful of their diagnoses than was formerly the case. When one disentangles the pure fibrous growths from all the others, some very interesting features come to light, as indicated in Table V. This deals only with pure fibrous growths of mesenchymal tissues in children. I have chosen to use children because I am studying their tumors extensively at the present time and can give the information more easily. In general, I have found that the proportion of most of these mesenchymal tumors in children compared with adults with a

TABLE IV.
SEVENTY-SEVEN CASES OF FASCIITIS
1948 to 1959 Included

Diagnoses Made		
Malignant		35
Fibrosarcoma	15	
Liposarcoma	11	
Sarcoma	9	
Benign		21
Fasciitis	13	
Other benign	8	
Not stated		21
Cases known to have recurred		5

few notable exceptions is in the ratio of 1 to 7. With the exception of the fibromatoses,[10] no special efforts have been made to obtain follow-ups, and the reports of metastases concern only those cases in which the knowledge of metastases has come to me. Nevertheless, I believe it furnishes evidence

TABLE V.
FIBROUS TUMORS IN CHILDREN

	Number	Known Metastases
Fibroma and keloid	25	0
Fibromatosis	172	1
Pseudosarcomatous fasciitis	11	0
Differentiated fibrosarcoma	27	0
Undifferentiated fibrosarcoma	11	2
Total	246	3

that the only really reliable malignant tumors are the undifferentiated fibrosarcomas.

One other piece of information contained in this table is of significance and must be kept in mind. It will be noticed that one of the 172 cases of fibromatosis metastasized. This is the case of a young child reported by Prior and Sisson[6] with a most innocuous appearing fibromatosis in a finger. Nine years after the removal of the fibromatosis, similar lesions appeared in both lungs, and the child died. While it is conceivable that the lung lesions represented new fibromatoses, the probability is great that they were metastases. This emphasizes the fact that exceptionally a histologic-

ally benign growth may be biologically malignant. It must be of very rare occurrence, but the possibility must be accepted as an unpleasant fact.

Summary

It can be appreciated from the foregoing that the problem of the behavior of pure fibrous growths both in adults and in children has been a difficult one to evaluate for the various reasons suggested. One source of error has been the failure to take into account the ability of an array of different cell types to act as facultative fibroblasts, resulting in other tumor types having been falsely called fibrosarcomas. Since many of these other types are truly malignant metastasizing tumors, this has suggested that any tumor called a fibrosarcoma is *ipso facto* a neoplasm that will frequently metastasize. Actually, the large majority of tumors called fibromatoses or fibrosarcomas is highly differentiated and in spite of cellularity, scarcely ever metastasize. Only a relatively small group characterized by dysplasia and marked mitotic activity is truly malignant and capable of metastasizing. Such tumors are almost always found deeply situated in the subcutaneous tissues or deeper. In addition to mistakenly calling other types of malignant sarcomas by the name of fibrosarcoma, the mistake is also made of calling other varieties of benign lesions by the term fibrosarcoma, such as fibrous xanthoma and pseudosarcomatous fasciitis.

It is wrong to suppose, however, that because a fibrous growth is classified with the benign tumors it is harmless, for almost all varieties are capable of insidious persistent infiltrative growth so that their palpable confines never correspond with their actual extent. This frequently leads to incomplete excision and recurrence. In some parts of the body, and particularly in children, this has led to loss of digits, extremities and even life.

Since these growths must be treated by surgery because they are radioresistant, the surgeon is faced with a difficult problem: not only may he be in clinical doubt concerning a neoplasm, but even the pathologist may be deceived by the histological appearance of the growth. The following observations based upon long experience with soft tissue tumors may be of aid in helping the surgeon plan his therapy. These apply not only to fibroblastic tumors but to a majority of soft tissue growths beneath the epidermis. Almost without exception, these tumors are not encapsulated and grow by insidious infiltration beyond their palpable limits. This means that unless some apparently uninvolved tissue surrounding the tumor is removed with it, local recurrence will often take place. If one of these tumors metastasizes, it is almost invariably through the blood stream and very seldom through the lymphatics. Therefore the successful removal of all the local lesion will almost always effect a cure if done before metastasis has occurred. In an extremity, wide local excision is just as effective as amputation if it can remove a zone of uninvolved tissue on all sides. The secondary removal of tissue, because the operator finds he has cut through tumor tissue at operation, never has the same chance of cure as an excision that primarily never enters the tumor field, for the knife and other instruments can implant tumor cells anywhere in a wound just as they can carry bacteria. Any part of the wound, including opened tissue spaces, may receive the viable implants, and recurrence may ensue. If a tumor is very large, the writer believes it is wise to take a careful biopsy before undertaking treatment, for this may influence the type of treatment to be undertaken. For small growths, the excision biopsy, observing the proper precautions, is probably best.

References

1. Bednár, B.: Storiform neurofibromas of the skin, pigmented and non pigmented. Cancer, 10:368, 1957.
2. Culberson, J. D., and Enterline, H. T.: Pseudosarcomatous fasciitis: A distinctive clinical-pathological entity. Ann. Surg., 151:235, 1960.
3. Dublin, W. B.: Reticulum. Arch. Path., 4:299, 1946.
4. Gross, R. E., and Wolbach, S. B.: Sclerosing hemangiomas: Their relationship to dermatofibroma, histiocytoma, xanthoma and to certain pigmented lesions of the skin. Am. J. Path., 19:533, 1943.
5. Konwaler, B. E., Keasbey, L., and Kaplan, L.: Subcutaneous pseudosarcomatous fibromatosis (fasciitis). Am. J. Clin. Path., 25:241, 1955.
6. Prior, J. T., and Sisson, B. J.: Dermal and fascial fibromatosis. Ann. Surg., 139:453, 1954.
7. Sherwin, R. P., and Friedel, G. H.: Pseudosarcomatous fibromatosis (infiltrative fasciitis): Report of two cases. Boston M. Quart., 10:49, 1959.
8. Stout, A. P.: Fibrosarcoma: The malignant tumor of fibroblasts. Cancer, 1:30, 1948.
9. Stout, A. P.: Tumors of the soft tissues, atlas of tumor pathology. Section II, fascicle 5. A.F.I.P., Washington, D. C., 1953.
10. Stout, A. P.: Juvenile fibromatosis. Cancer, 7:953, 1954.

Evaluation of a Nasal Decongestor in Pollinosis

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IN FEW fields of medicine can the physician obtain such prompt patient satisfaction as in the treatment of pollinosis. This is especially true with one of the newer formulations available in a timed-release tablet containing a sympathomimetic of unusual duration of action, phenylpropanolamine hydrochloride,[1] plus two antihistamines, pheniramine maleate and pyrilamine maleate.*

The management of the allergic state involves providing control by avoidance of the offending allergen, specific desensitization therapy, and prompt alleviation of allergic symptoms. Sheldon comments on this point in an excellent review:[2] ". . . the problems facing every clinician when he first meets a patient with an allergic disease are that of immediate control of the patient's symptoms and a studied approach to prevent further attacks."

In addition to the desirability of correcting the basic cause of the allergy, it is important that the patient receive early relief of symptoms. This is imperative not only for the sake of patient satisfaction, but also to circumvent the appearance of dangerous sequelae to the allergic state. Allergic rhinitis, left unattended, may lead to development of asthma, nasal polyposis, recurrent frontal headaches, unrelieved tonsillitis, adenoiditis, and deafness.

Feinberg has reported that 30 to 40 per cent of patients with hay fever in the Mid-Western States will ultimately develop asthma.[3] Nasal blocking forces the patient to mouth breathing and exposes the bronchi to increased irritation by pollen. Also, the constant insult of offending allergens on the contact zones of the nasal mucous membrane gives rise to vasodilation and development of nasal polyps which may result in almost complete nasal obstruction and impaired sinus drainage.[4] Eighty-six per cent of recurrent frontal headaches are due to allergic conditions involving the nasal cavity.[5] These headaches may be prevented by proper diagnosis and treatment.

Early recognition and treatment of allergy in children may save some patients from unnecessary laryngological surgery.[6] Unsatisfactory results following tonsillectomies and adenoidectomies, which according to Kaiser and cited by Thomas, occur in some 50 per cent of operated patients, are largely due to allergic involvement.[6,7] Blank reports that a "common cause of deafness in children is thought to be due to serous otitis media which is now recognized as an allergic entity."[8]

This study was generated with the objective of affording *increased relief* to patients suffering from allergic disorders. In so doing, it was expected that greater patient satisfaction would result and that the appearance of dangerous and distressing sequelae could be circumvented or reduced in frequency.

Method of Study

One hundred and twenty-eight patients were studied in private practice during the late summer and early fall of 1958 to determine:

1. The incidence of upper respiratory allergy as measured by number of patient visits in relation to daily pollen count.

2. The degree of symptomatic relief afforded by a new decongestant-antihistamines formulation as compared to previous single anthistamine therapy.

3. The more satisfactory control of symptoms and reactions during desensitization.

Dosage

Wishing to use the minimum amount of drug consistent with good results, all but five patients

*Triaminic®. Each tablet contains Phenylpropanolamine hydrochloride, 50 mg.; Pheniramine maleate, 25 mg.; Pyrilamine maleate, 25 mg.; in a timed-release tablet. Supplied by the Smith-Dorsey Division of the Wander Company, Lincoln, Nebraska.

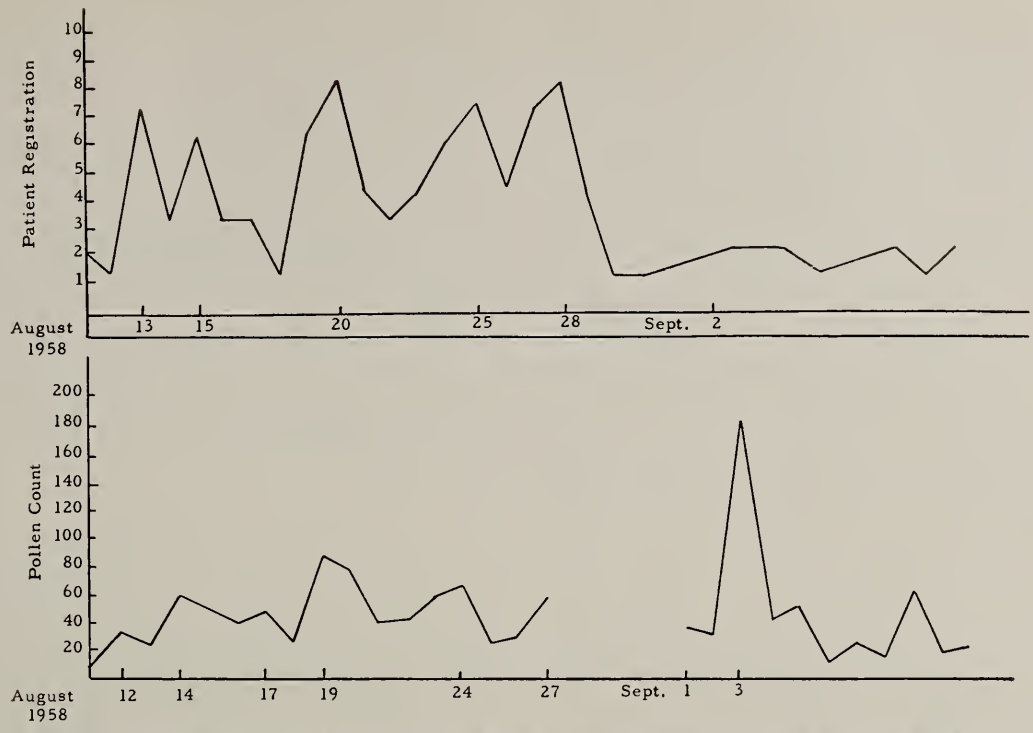


Fig. 1. Comparison of pollen count to patient visits for allergic rhinitis symptoms (showing possible relationship between increased pollen count and increased incidence of patient visits).

were started on one tablet b.i.d. The symptoms of the remaining five patients were so intense, it was felt advisable to place them on t.i.d. dosage to afford every opportunity for relief. Subsequent to initiation of therapy, of the 123 patients on b.i.d. dosage, four patients were placed on one tablet three times a day because of unsatisfactory response at the lower dosage level. Simplification of dosage was facilitated because this medication is available in a timed-release tablet affording six to eight hours of action.

TABLE I. DEGREE OF SYMPTOMATIC RELIEF OBTAINED WITH SINGLE ANTIHISTAMINE COMPARED WITH NASAL DECONGESTANT PLUS TWO ANTIHISTAMINES

Response	Previous Therapy (Single Antihistamine)		Present Therapy (Nasal Decongestant Plus Two Antihistamines)	
	Number of Patients	Per Cent of Total	Number of Patients	Per Cent of Total
Good	9	11.2	122	95.3
Fair	64	81.0	2	1.6
Poor	3	3.9	3	2.3
No change	3	3.9	1	0.8
Total	79	100.0	128	100.0

Results

Patient visits directly coincided with increased pollen counts. With the exception of the peak pollen count during the first week in September, the majority of patients requested treatment the same day or approximately twenty-four hours following days of high pollen counts (Fig. 1). It may be explained that the peak count on September 3, 1958, was not followed by a heavy patient load for the simple reason that most of the patients in this practice were under treatment prior to that time.

Of the 128 patients studied, single antihistamine therapy had been employed in seventy-nine during the previous allergy season (1957) with less than satisfactory results. It is readily apparent from Table I that the addition of an effective nasal decongestor and a second antihistamine contributed materially to patient comfort and protection from subsequent unpleasant allergic episodes.

The criteria used in judging degree of response are based on personal observation and patient appraisal. A "Good" response is necessarily a decided diminution of rhinorrhea, nasal obstruction, sneezing, lacrimation, and itching of the eyes and throat. Those patients who received some benefit, but lacking in degree and duration of relief, were classified as receiving "Fair" response. The "Poor" response group demonstrated little change in symptoms.

The symptoms of patients receiving concurrent desensitization were adequately controlled with the

decongestant-antihistaminic formula until such time that the patient could be maintained relatively free of symptoms without medication. This procedure has been found important because many patients seek desensitization therapy only when the

TABLE II. DEGREE OF SYMPTOMATIC RELIEF OBTAINED WITH TEST MEDICATION CONCURRENT TO DESENSITIZATION

Response	Number of Patients
Good	51
Fair	0
Poor	0
No indication	1
Total	52

pollen season is well advanced. In addition to specific desensitization, the allergic patient is deserving of the symptomatic relief afforded by this formula. The degree of relief obtained with the test medication concurrent to desensitization is well-illustrated in Table II.

Side Effects

An added advantage to this formula lies in the relative absence of side effects (Table III). This virtus is due to the pharmacologic balance between the soporific effect often induced by antihistamines

TABLE III. SIDE REACTIONS WITH TEST MEDICATION

Degree of Reaction	Number of Patients	Per Cent
No reaction	90	70.3
Minimal	35	27.4
Moderate	3	2.3
Total	128	100.0

and the slight CNS stimulation of the phenylpropanolamine HCl. Multiple histamine antagonists often reduce side effects without sacrificing therapeutic effectiveness.[9-12] This feature was valuable in this group of patients for most of them continued their employment or household duties without interruption throughout the allergy season.

Discussion

Highly satisfactory results were obtained with the oral decongestant at low dosage due to its timed-release feature. Experience has shown that continuous dosage throughout the day tends to call the patient's attention to his condition and during the night interrupts his sleep. The value of long-acting medication in the treatment of the allergic state has had previous documentation in the literature.[13]

It has been found that the oral administration of the sympathomimetic amine, phenylpropanolamine HCl, and the two antihistamines, pheniramine maleate and pyrilamine maleate, provides marked relief of nasal obstruction, rhinorrhea, lacrimation, itching of the eyes and throat. The degree of relief would seem to forestall the development of the dangerous and distressing consequences of the untreated allergic state. Greater relief was afforded the patient without congestive rebound.

Summary

A series of 128 patients, of which seventy had received only fair (or poorer) response to a previously administered single antihistamine, has been reported. Ninety-five per cent received good results on a product containing a nasal decongestant and two antihistamines.

References

1. Goodman, L. S., and Gilman, A.: The Pharmacological Basis of Therapeutics, ed. 2. P. 508. New York: Macmillan, 1955.
2. Sheldon, J. M., Henry, L. D., and McLean, J. A.: An evaluation of medications commonly used in asthma. J. Michigan S. M. Soc., 58:397 (March) 1959.
3. Feinberg, S. M.: Allergy in Practice. P. 576. New York: Year Book Publishers, 1949.
4. MacLaren, Walter R.: An evaluation of Triaminic and hydrocortisone in the treatment of nasal allergy, nasal polyposis, and asthma. Ann. Allergy, 17:546 (July-Aug.) 1959.
5. Ogden, H. D.: Headache Studies. Scientific Exhibit, Eleventh Annual Scientific Assembly, Amer. Acad. of Gen. Prac., San Francisco, April 6-9, 1959.
6. Thomas, J. W.: Allergic reactions of the respiratory system including sinus involvement. West Virginia M. J., 55:129 (April) 1959.
7. Kaiser, A. D.: Significance of tonsils in development of the child. J.A.M.A., 115:1151 (Oct. 5) 1940.
8. Blank, Philip: Clinical pediatric allergy. West Virginia M. J., 55:126 (April) 1959.
9. Naranjo, P., and de Naranjo, E. B.: Studies of the combined action of some antihistamine agents. Ann. Allergy, 11:699, 1953.
10. Sheldon, J. M.: The place of antihistamines in the treatment of allergic disorders. Postgraduate Med., 14:465 (Dec.) 1953.
11. Wittich, F. W.: A clinical report on the use of Dibistine in the treatment of allergies. Ann. Allergy, 10:625 (Sept.-Oct.) 1952.
12. Hubbard, T. F., and Berger, A. J.: The use of a combination of two antihistamine drugs in the treatment of allergic vasomotor rhinitis. Ann. Allergy, 8:350 (May-June) 1950.
13. Silbert, N. D.: The familial pattern and treatment in the changing allergic state. GP, 19:3 (March) 1959.

Clinical Experience with Librium in Private Practice

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TABLE I. DIAGNOSTIC CATEGORIES AND RESULTS ATTAINED WITH LIBRIUM*

Diagnosis	Number of Patients	Results			
		Excellent	Satisfactory	Unsatisfactory	Questionable
Obsessive-compulsive	11	4	7		
Reactive depression	12	4	8		
Simple depression	3	1	1		1
Manic depressive	2	1		1	
Schizophrenia	2	1	1		
Schizoid personality	5		4	1	
Neuroses	4	2	2		
Neurasthenia	1			1	
Post-psychopathic	1		1		
Hypomanic	1		1		
Anxiety depression	7	3	3	1	
Agitated depression	2	1	1		
Total	51	17	29	4	1

*Trademark for methaminodiazepoxide, Hoffmann-La Roche, Inc., Nutley, New Jersey.

MUCH OF psychiatric practice with chronically disturbed patients who seek help for their emotional ills is, of necessity, empirical. One or another modality, sometimes in combination, is employed to give the patient symptomatic relief as promptly as possible. The intensity of treatment is determined by the severity of incapacitation, but is also conditioned by patient co-operation which depends partly on the effectiveness of therapy. If the patient finds little relief in what seems to him a reasonable time, he is lost to further treatment until his symptoms become intolerable and he once again turns to the psychiatrist for help. The advent of psychiatric drugs has greatly facilitated the therapist's problem of sustaining treatment for a long enough period to enable him to get at the root of the ailment and achieve some measure of lasting improvement.

In common with most psychiatrists, the author does not look to *one* drug or even *several* as a panacea for neuroses and psychoses. Sharing the skepticism of some of my colleagues when Librium,* a new psychotherapeutic agent, was brought to my attention, I had reasonable doubts about its potential value. However, empiricism dictated the decision to put to clinical test a drug that offered promise of possible efficacy in the stubbornly unresponsive case.

This new drug had proved its remarkable taming effects in animals, much greater potency to relax tension and reduce fear than meprobamate, yet apparently did not interfere with alertness, or motor activity.[1] Its wide margin of safety was an-

*Trademark for methaminodiazepoxide, Hoffmann-La Roche, Inc., Nutley, New Jersey.

other determining factor in testing this new clinical tool. (Since the initiation of this clinical trial, several investigators have reported their results with this drug[2]).

Librium was therefore prescribed to a number of patients who previously received little or no relief of their mentally incapacitating symptomatology.

Patient Material

The group under study comprised fifty-one psychiatric patients (twenty-two male and twenty-nine female) ranging in age from twenty-one to seventy-three, 60 per cent of whom were between thirty-one and sixty. The diagnostic categories included reactive depression, anxiety depression, agitated depression, obsessive-compulsive reactions, schizophrenia, and schizoid personality. As can be seen from Table I the two largest diagnostic groups were reactive depressives and obsessive-compulsives, constituting nearly half of the total.

The duration of illness prior to treatment with Librium ranged from several months to twelve years, and the severity of the disturbances varied from a mild neurosis to manic depression. Previous modalities included psychotherapy, electro-shock therapy and the gamut of psychotropic drugs.

Patients were told that they were being given a new test drug which might or might not be more beneficial than previous medications. The dose varied from 25 mg. a day, usually at bedtime, to 25 mg. q.i.d. Approximately half of the patients (twenty-six) received the medication 25 mg. t.i.d., and one-fourth (thirteen) 50 mg. at bedtime. The duration of treatment varied from two to twenty weeks, and twenty-five received it for a period of two to four weeks.

Evaluation of results was based on subjective response reported by the patient, effect on behavior observed by the author, alleviation of symptoms sufficient to enable the patient to achieve a modicum of social adjustment, and improved interpersonal relationships. Since the psychiatric history and response to previous therapy had been well known to the author, any variation in response was readily perceptible; frequently the changes in behavior were recognized by the patient's family and friends.

Results

The over-all response to Librium and the results obtained in each category are summarized in Table I. (See preceding page.) Of the fifty-one patients, eleven had shown an excellent response, twenty-nine satisfactory, four were unimproved, and one patient who did not return after one week of the medication is included in the column designated as "questionable."

As can be seen from the table, the unsatisfactory results were obtained in one each of the manic depressive, schizoid personality, hypomanic, and anxiety-depressive groups. All patients in the obsessive-compulsive and reactive-depression categories and all but one of the patients with anxiety depression exhibited from good to excellent improvement.

The onset of effect of the drug was usually discernible both subjectively and behavioristically within a few days to a week, and most patients had gratifying results within two to four weeks, to the point where the medication could be reduced or discontinued. There were no ill effects even in patients who received the drug for as long as twenty weeks. One patient reported being drowsy on 75 mg. daily, and several who found that 50 mg. during the day made them sleepy, were improved when given the same dose at bedtime rather than during the day.

Frequently the patient had remarked that this medication "did more for them than any other tranquilizer." Patients who had been previously on meprobamate or other currently employed drugs expressed their satisfaction by saying that they "felt better on this drug than on any other." Its calming and relaxing effect provided the patient with sufficient support to derive greater benefit from psychotherapy than was otherwise possible.

A few typical case histories will serve to illustrate the type of response observed.

Report of Cases

Case 2.—Man, aged thirty-two, diagnosed as an obsessive-compulsive with symptoms dating back several months, has been on the medication, 25 mg. b.i.d. This patient had always been a perfectionist, but more recently began to worry so much over trifles as to interfere with both his work and sleep. He has been on the medication for 5 months and finds that it makes him "more relaxed" and he is enjoying life and his work in a way he has never before experienced. No untoward reactions or side effects were observed.

Case 6.—Woman, aged fifty-three. Diagnosis: reactive depression. Present illness was of three and one-half years' duration. This patient was started on 25 mg. t.i.d. and maintained on this dose for three months. She exhibited remarkably complete remission of symptoms, and

reported that she felt better than on any previous tranquilizer. When she was without medication for three days she became depressed, nervous, and upset. Reinstitution of the medication once more restored the calm she enjoyed on the drug. No side effects were noted.

Case 11.—Woman, aged sixty-six. Diagnosis: situational neurosis. When first seen the patient reported that her illness began about a year earlier when she moved to another town. Since then she had been unable to adjust to her new environment. Librium, 25 mg. t.i.d., was prescribed, but she found that this dosage-schedule made her drowsy. The dose was reduced to 25 mg. at 6 p.m. and at bedtime, which gave her a good night's sleep. She has been on this regimen for three months and has shown marked improvement in adjusting to the change which initially caused her disturbance.

Case 12.—Man, aged thirty. Diagnosis: anxiety neurosis. This patient gave a history of chronic anxiety and tension of twelve years' duration. Because of the chronicity of his condition, Librium was first prescribed at a dose of 25 mg. q.i.d. The patient has been on the medication for six months and is being maintained at a dosage schedule of 25 mg. morning and noon and 50 mg. h.s. He expressed a distinct preference for Librium over chlorpromazine which he had taken previously, and has shown an excellent response to Librium. He is relieved of his anxiety, thinks more clearly, and no longer suffers from a variety of fears he formerly experienced. He has also given up drinking which he often used previously "to calm my nerves," as he stated. He still has an occasional emotional set-back which requires supportive psychotherapy. In the six months of treatment he has shown no clinical side effects.

Case 15.—Woman, aged forty-seven. Diagnosis: manic depressive. This patient, a wife of a physician, had recurring episodes of hypomanic and manic phases for fifteen years. She was committed to a state hospital, but managed to escape from there. She refused to return home because she constantly clashed and quarreled with her husband and children. She was placed on Librium, 25 mg. q.i.d., and has been on the same dose for the past three months. She became less irritable, more cooperative, and regained insight. Her attitude towards her family changed for the better. She became interested again in her personal appearance. No adverse effects from the drug have been noted.

Comments and Conclusions

On the basis of fifty-one patients with a wide range of mental illness no attempt is here made to interpret the results in the terms of a definitive study. In reporting them, it is my purpose to convey my frankly unexpected finding that the response to Librium was indeed favorable. All but four patients who appeared not to have derived any help and one in whom the response was questionable, volunteered expressions such as "this drug is much better than anything prescribed to me before."

It should be pointed out that these patients suffered from a variety of psychiatric illness: obsessive-compulsion, reactive, anxiety and agitated depression, and several were schizophrenic or exhibited a typical schizoid personality. Regardless of the severity and duration of previous illness, alleviation of symptoms and improvement in behavior were unequivocal in the sizable number of patients benefited. The onset of improvement, in some instances within days, was sufficiently encouraging to the patient to want to continue with the treatment. Half of the patients experienced a most satisfactory therapeutic effect within two to four weeks on 25 mg. t.i.d., and are consistently maintaining this improvement.

Patients who have been on the medication for as long as twenty weeks have shown no adverse side effects. Drowsiness, reported by a few patients, was easily avoided by reducing the dosage to 10 mg. t.i.d. and 25 to 50 mg. at bedtime. This provided a good night's sleep without the need of additional nighttime sedation, and freed the patient from incapacitating fears and anxieties. The effects on behavior, social adjustment, and ability to face average stresses, as well as evidence of renewed interest in life, were remarkable. Those who required supportive psychotherapy were helped to accept more prolonged treatment.

On the basis of this study, Librium appears to me to be a most welcome, efficacious, and safe drug in the treatment of ambulatory patients in psychiatric office practice. It is my intention to continue to prescribe this drug in preference to other agents to relax the patient adjunctively to psychotherapy.

References

1. Randall, L. O.: Pharmacology of methaminodiazepoxide. Dis. Nerv. System, 21: Sect. 2, 7 (March) 1960.
2. Symposium on newer antidepressant and other psychotherapeutic drugs, Their Use in Psychiatry and Other Branches of Medicine. Dis. Nerv. System, 21: Sect. 2 (March) 1960.

Invasive Hydatidiform Mole in the Urinary Bladder

The successful management of the rare hydatidiform mole is a rewarding achievement.

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THE URINARY bladder is rarely invaded by hydatidiform mole or chorionepithelioma. Recent pertinent literature contains no mention of vesical invasion although extensive metastases to other organs have frequently been cited. The following case is reported both because of its unusual features and to describe a method of conservative treatment.

The patient, a nineteen-year-old girl, was admitted to the hospital on July 21, 1958. A benign hydatidiform mole had been delivered at another hospital in May, 1958, followed by a dilatation and curettage. Intermittent bleeding ensued which was assumed to be vaginal in origin. Three weeks prior to admission, urinary obstruction developed which was relieved by passage of clotted blood. She was hospitalized after several recurrences of these symptoms.

Physical examination was normal, except for findings on pelvic examination done under general anesthesia at the time of cystoscopic examination. The cervix, uterine corpus and adnexae were normal. A movable, smooth, firm mass about two centimeters in diameter was palpated to the left of the midline in the region of the vesical trigone. No connection between the mass and the cervix could be felt.

The initial hemoglobin level was 7 grams per cent. The catheterized urinalysis showed many red blood cells. On July 25, the frog test for urinary chorionic gonadotropins was negative. The chest x-ray was normal. An excretory urogram demonstrated normal kidneys and a filling defect in the left side of the bladder.

On July 22, a dilatation and curettage was performed. Decidual reaction of endometrium was found without evidence of neoplasm or hydatidiform mole.

On July 23, cystourethroscopy showed a raised lesion on the left side of the trigone measuring about 1 centimeter in diameter covered with normal vesical mucosa except for a bleeding ulcerated area on the medial aspect. The left ureteral orifice was elevated on the lateral aspect of the tumor. The rest of the bladder and the urethra appeared normal. The lesion was biopsied with the resectoscope. Vigorous bleeding which followed was controlled by prolonged fulguration. Microscopically, the tumor consisted of blood clot, fibrin, leukocytes and fragments of degenerating chorionic

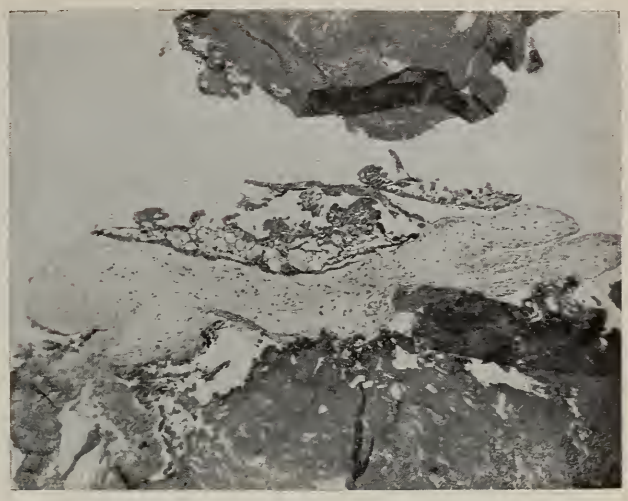


Fig. 1. Degenerating chorionic villus surrounded by blood clot, fibrin and leukocytes, low power field.

Presented at the meeting of the Minneapolis Academy of Medicine, October 20, 1958.

villi surrounded by trophoblastic cells (Fig. 1). This pattern was considered typical for a benign invasive hydatidiform mole, and the patient was discharged for further observation. Occasionally, metastatic nodules of an invasive hydatidiform mole will spontaneously disappear and a similar occurrence was believed possible with our patient. However, the close proximity of the markedly vascular tumor to the vesical lumen made operative intervention necessary before regression could occur. Hematuria and clot retention developed on July 29, requiring emergency cystoscopy, evacuation of clots, and fulguration of bleeders in the lesion. On July 31, the tumor was resected transurethrally. It consisted of a sharply demarcated cavity in the bladder wall filled with reddish-purple material. Several small finger-like processes which extended outward for a few millimeters from the main cavity were carefully destroyed. The left ureteral orifice was resected. Underlying bladder muscle fibers appeared clean, and bleeding was easily controlled. An inlying urethral catheter was removed twenty-four hours later; the patient voided satisfactorily and she was discharged on August 3. Microscopic examination of the excised tissue again showed invasive hydatidiform mole without evidence of chorionepithelioma.

The patient returned for a follow-up examination on October 13, 1958. She had no symptoms. Catheterized urinalysis showed 10 to 15 white blood cells per high power field. The urinary gonadotropin test was negative. No abnormalities were found on bimanual pelvic examination. Cystourethroscopy showed the resected region to be well healed except for an area of slough about one centimeter in diameter just above the vesical neck which grossly resembled post-resection inflammatory tissue. The left ureteral orifice was patent and well healed. The remaining portions of the bladder were normal. Further follow-up studies will be conducted at frequent intervals.

Discussion

An hydatidiform mole is a placental tumor whose development depends upon three factors: 1. Disappearance of fetal circulation due to death of the fetus, 2. edema of the villous connective tissue, and 3. nourishment of the functioning tropho-

blast by the maternal circulation. It occurs in approximately one in twenty-five hundred pregnancies and only about 2 per cent are followed by a chorionepithelioma (Novak and Novak).

Although the pathologic classification of hydatidiform mole has not been completely standardized, that of Novak and Novak is adequate for clinical purposes. Two subdivisions, benign and invasive, are recognized. The benign hydatidiform mole shows no destructive invasion of uterine tissue, varying degrees of trophoblastic activity and good preservation of chorionic villous pattern. The invasive hydatidiform mole, however, penetrates deeply into the myometrium and invades parauterine structures and vaginal tissues. Trophoblastic activity is more abnormal than in a benign mole, but the villous pattern is still preserved. In contrast, a chorionepithelioma is composed of sheets of invasive and destructive trophoblastic cells which have lost all semblance of chorionic villi. Novak and Novak state that regardless of the degree of trophoblastic overgrowth, the presence of choironic villi indicates a benign rather than malignant process.

Benign trophoblast exhibits many of the invasive qualities of carcinoma. During pregnancy, groups of trophoblastic cells and even chorionic villi are swept into the maternal circulation, and lodge and continue to grow in the lungs. These "physiologic metastases" normally disappear after termination of pregnancy, probably due to maternal defensive mechanisms. Hertig and Mansell state that roentgenologically demonstrable metastases from an invasive hydatidiform mole have been observed to disappear spontaneously. Evidently in the present case, molar villi were transported from the uterus to the vesical trigone through venous channels and continued to grow. Eventually, ulceration and hemorrhage occurred into the bladder lumen.

Clinicians agree that any patient suspected of having an invasive hydatidiform mole or chorionepithelioma should have frequent biologic assays of chorionic gonadotropins. Repeatedly positive tests, especially if the quantitative titre rises, constitutes an indication for hysterectomy. From this point, however, these two diseases differ markedly in their behavior. The patient with the invasive mole, judged either by histologic appearance of the trophoblast or presence of well formed chorionic villi, has an excellent chance of cure. Extensive metastatic lesions do not appear, and the few deaths that have occurred have been due to sepsis or uncontrolled intraperitoneal hemorrhage. On the other hand, a true chorionepithelioma, which is a carcinoma of villous epithelium, usually metastasizes to distant organs and death results from carcinomatosis.

Our patient presented the problem of management of a metastatic bleeding vesical tumor. She was only nineteen years old and in otherwise good health. The urinary chorionic gonadotropin test was negative, probably due to insufficient viable trophoblast being present at the time to give a positive result. Biopsy of the tumor showed a lesion of known benignancy, removal of which is usually followed by cure of the disease. Prompt therapy was necessary because of recurrent hemorrhages. We believed that transurethral resection of the bladder tumor was indicated rather than an open operation which would have undoubtedly resulted in cystectomy, panhysterectomy and urinary diversion to an isolated ileal loop. Close follow-up with repeated chorionic gonadotropin assays, chest x-rays, and cystoscopic examinations has been advised.

Summary

A nineteen-year-old patient with an invasive hydatidiform mole in the urinary bladder has been reported. A brief summary of clinical and pathological aspects of hydatidiform mole and chorionepithelioma has been presented. A possible method of pathogenesis in this instance has been discussed.

Additional Note

Since the presentation of this paper, the patient has been repeatedly examined, and no recurrence of molar tissue has been found. The latest examination was September 14, 1959. The chest x-ray was negative and cystoscopy showed the bladder well healed. Against medical advice, she has become pregnant and she is presently under the care of an obstetrician.

References

1. Hertig, A. T., and Mansell, H.: Hydatidiform mole and choriocarcinoma. Atlas of Tumor Pathology, Armed Forces Institute of Pathology, 1956.
2. Novak, E., and Novak, E. R.: Gynecologic and Obstetric Pathology. p. 522. Philadelphia: W. B. Saunders Company, 1958.

Fractures of the Tibia

TABLE I. FRACTURED TIBIAS AT MINNEAPOLIS GENERAL HOSPITAL
From January 1, 1955 To January 1, 1958

	Transverse	Oblique	Comminuted	Total
Fibula intact	6	9	5	20
Fibula fractured	30	27	29	86
				106

An Analysis of Treatment at Minneapolis General Hospital

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TIBIAL fractures occur frequently and, since treatment must be individualized, each patient presents a specific problem in management. To provide insight into the problem of therapy, the patients admitted to the fracture and orthopedic service at the Minneapolis General Hospital with tibial fractures for the period January 1, 1955 to January 1, 1958, were analyzed. Records of 153 patients were reviewed. Twenty-two patients died soon after admission or early in the post-fracture period precluding follow-up information, and eleven transient patients were also lost to follow-up evaluation. Twenty-five of the patients with fractured tibias were children, and all of these patients had reduction by closed methods with uniformly good results.

Excluding the foregoing fifty-eight patients, a total of ninety-five patients comprised the study group. In eleven patients, bilateral fractures of the tibia were sustained; thus a total of 106 fractured tibias were analyzed.

Classification

Many types of classification exist with some based on the degree of injury, and others on the type of fracture or associated components of the fracture. The following division, however, appears to be a more useful grouping of these fractures; (1) tibial fractures with intact fibula, and (2) tibial fractures with a broken fibula. This separates injuries with grossly unstable fractures from those fractures having some element of remaining stability prior to treatment. Each category was subdivided into transverse, oblique, and comminuted types (Table I).

Therapy

Therapy has varied according to the presence or absence of fibular fractures in most cases. In our series of twenty cases of tibial fracture with intact fibula, none have been treated with internal fixation. Although this small number of combined cases may not be statistically significant, a practical aspect should be emphasized. These cases, including both simple and compound injuries have all been satisfactorily treated with long leg plaster immobilization. Some, however, have required remanipulation to correct minor angulations and displacements.

Therapy for the second broad category, fractured tibia with fractured fibula, has not been so uniform. The methods are divided into four groups:

TABLE II. RESULTS OF TREATMENT OF FRACTURED TIBIAS

Analysis Criteria	Fibula Intact			Fibula Broken					
				Transverse		Oblique		Comminuted	
	Transverse	Oblique	Comminuted	Internal Fixation	No Internal Fixation	Internal Fixation	No Internal Fixation	Internal Fixation	No Internal Fixation
Total limbs	6	9	5	7	23	11	16	10	19
Restricted knee	1	2	3	1	5	3	2	3	8
Restricted ankle	0	2	0	3	4	1	1	3	4
Shortening	0	2	1	3	10	1	2	3	6
Neuro-vascular	0	0	1	2	2	1	1	2	4
X-ray	1	3	2	2	5	3	7	2	4
Cosmetic	0	0	0	0	1	0	2	1	2
Symptomatic	2	1	2	3	4	2	2	5	8

A. Long leg plaster with or without the aid of anesthesia.

B. Traction by means of Kirschner wire fixation through os calcis and immobilization in a Baylor-

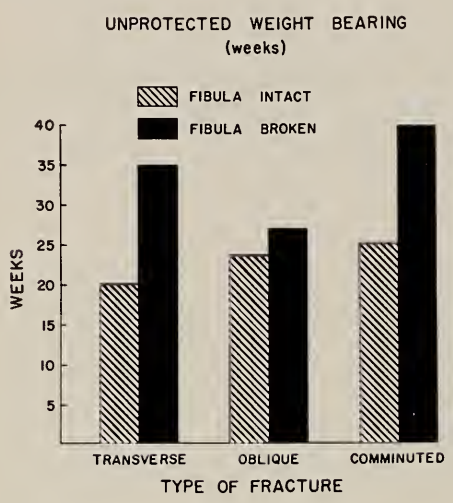


Fig. 1.

Braun frame. This type of fixation has been maintained for varying periods from three to five weeks with subsequent plaster immobilization until convalescence has been completed.

C. Extra-skeletal fixation utilizing transfixation wires through the fragments of the tibia and incorporated into the plaster cast.

D. Internal fixation: In simple fractures only one of the sixty-five cases had internal fixation prior to a trial manipulation and plaster immobilization. In several instances, the internal fixation technique was used following debridement of a compound wound; all areas involved were redraped prior to the fixation procedure. Internal fixation was also used as a delayed form of definitive therapy with bone grafts, bone chips, or a sliding type of graft.

Results

Success in treating fractures of the tibia depends on several criteria which are difficult to assess. In Table II, these fractures are analyzed according to seven different criteria which serve to provide a basis for expected end results.

Transverse Tibial Fractures

Six patients with transverse tibial fractures and intact fibulas did well. Thirty tibial fractures with the fibula broken were treated primarily with long leg plaster immobilization. Seven were treated with internal fixation. Table II summarizes these results and emphasizes the common occurrence of shortening. This did not appear to be symptomatic nor associated with significant disability.

Oblique Fractures

Table II summarizes the functional results of the oblique tibial fractures separated into those with

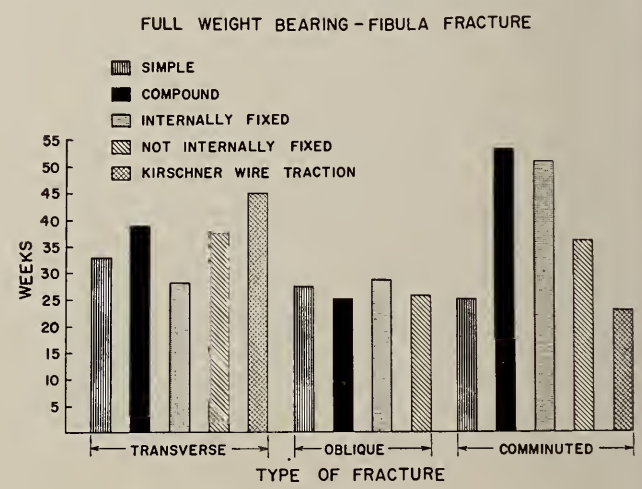


Fig. 2.

"fibula intact" and those with "fibula broken." Further subdivision into cases with and without internal fixation reveals: 1. Nine patients in the subgroup "intact fibula" who did not have internal

fixation; 2. Five patients with a combined fractured fibula were treated with plaster immobilization; 3. Internal fixation was used in eleven instances with a fibular fracture. Of note in the

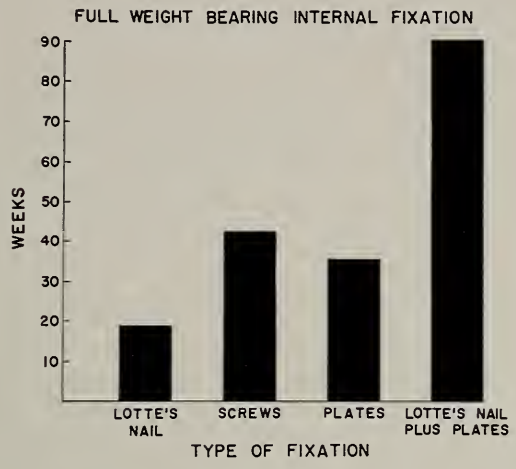


Fig. 3.

"oblique fracture with fibula intact" group is the possible association of altered mechanics of alignment and restricted motion.

In the "fractured fibula" subgroup those without internal fixation had a moderate frequency of x-ray malalignment as compared to those internally fixed. Symptomatically the results did not appear to be adversely affected by such malalignment.

Comminuted Tibial Fractures

Of twenty-nine patients with a combination of fractured tibia and fibula, ten were treated with internal fixation; nineteen were treated with manipulation and plaster, or skeletal traction. Attesting to the severity of this kind of injury is the high percentage of neurovascular sequelae resulting in this group as compared to the other types of fracture.

Weight Bearing

A comparison of similar types of tibial fractures in the two groups of internal fixation and plaster or traction are analyzed as to the time of full weight bearing without external support (Fig. 1).

UNPROTECTED WEIGHT BEARING

	Fibula Intact (average weeks)	*Fibula Broken* (average weeks)
Transverse fractures	20.3	36.0
Oblique fractures	23.6	26.6
Comminuted fractures	25.6	40.7

Several further breakdowns have been utilized in an attempt to crystallize impressions rather than to specifically outline objectives of treatment. As was mentioned previously, none of the twenty patients of tibial fractures with intact fibula were treated with internal fixation. Only one of those twenty fractures was compounded.

Further analysis of the fractures as to type and method of treatment is depicted in the following three tables and demonstrated in Figure 2.

TRANSVERSE FRACTURE, FIBULA BROKEN

	Number	*Average Weeks Full Weight*	
Simple	13	33	
Compound	17	39.1	(one non-union at 108 weeks)
Internally fixed	7	28.7	
Not internally fixed	23	38.2	(one fibrous union 80 weeks; one osteomyelitis and bone graft 104 weeks)
Kirschner wire traction	3	45.3	

OBLIQUE FRACTURE, FIBULA BROKEN

	Number	*Average Weeks Full Weight*	
Simple	20	27.3	
Compound	7	24.9	
Internally fixed	11	28.4	(3 non-union and grafts: 64, 52 and 48 weeks)
Not internally fixed	16	25.4	

COMMINUTED FRACTURES, FIBULA BROKEN

	Number	*Average Weeks Full Weight*	
Simple	13	25	
Compound	19	53.6	(2 non-union and bone grafts at 68 and 144 weeks)
Internally fixed	10	50.8	
Not internally fixed	19	35.4	(2 non-unions at 68 and 92 weeks)
Kirschner wire traction	3	22	

Twenty-eight limbs in all categories had internal fixation. The following is a summary of the various methods used and average time of healing (Fig. 3).

ALL CATEGORIES

	Number	*Average Weeks Full Weight*	
Lotte's nail	9	18.4	
Screws	8	41.9	(3 non-unions and bone grafts)
Plates	9	36.1	(1 osteomyelitis and 1 non-union and bone graft)
Lotte's nail plus plates	2	92	

Discussion

In transverse tibial fractures with the fibula intact the two symptomatic patients had unrelated osteomyelitis of the distal one-third of the femur with malunion of the hip on the same side; otherwise results were excellent. However, in those patients with a fracture of the fibula there was a significant number with shortening in those with, as well as without, internal fixation. There was a small number in each category with x-ray malalignment. This did not necessarily contribute to either a cosmetic or symptomatic abnormality.

Oblique fractures with the fibula intact show a fair amount of x-ray abnormality but again seemingly without symptoms. This x-ray picture of malalignment was also present in those with the fibula broken. It was most marked in those without internal fixation but not eliminated by internal fixation. Despite the x-ray picture these patients were generally asymptomatic.

Without a doubt the patients with the most residual symptomatology were those with comminuted fractures whether or not the fibula was intact. There was no apparent explanation for restriction of knee motion in those patients with the fibula intact. In the "fractured fibula" subgroup, the results did not differ significantly whether or not internal fixation was used. An added indication of the seriousness of trauma was the relatively high percentage of neurovascular impairment. In the group without internal fixation, there was a tendency for relatively more shortening.

Mechanical factors affected by minor degrees of angulation should be emphasized, for when the distal fragment is laterally displaced without angulation, there is a definite shift of the patient's weight bearing to the medial aspect of the ankle joint. This occurs even though a parallel line of weight bearing is created. When a valgus bow is created there is sometimes a prominence of the proximal fragment creating a significant cosmetic disability. In addition to this prominence, the weight bearing again is dropped medial to the ankle joint per se. With a varus bow, however, a tendency to overcome the subcutaneous prominence is present and also there is a tendency to restore weight bearing to a normal line.

Internal fixation in our institution reduced the incidence of x-ray malalignment. Shortening was still present in a significant number of cases so treated although usually anatomical results were obtained initially. This was the result of either subsequent procedures or intramedullary fixation with later shortening at the fracture site.

In regard to the time for various types of fractures to heal, there seems to be little choice between internal fixation or no internal fixation. Complications were not found to be any more frequent in the internally fixed group than in those treated with a long leg plaster only. The use of internal fixation in an attempt to improve immobilization and hasten early movements of both the knee and ankle has not proved effective. In the nine cases where a lotte's nail was used alone for internally fixing a fracture, the average time for full weight bearing was only 18.4 weeks. The average period of twenty-two weeks for complete healing of comminuted fractures with the fibula broken, and treated with Kirschner wire traction and subsequent long leg casting, was not expected.

Some difference was also noted between the two groups with, or without a fracture of the fibula. In those fractures in which the fibula was intact, all fractures healed with complete union. In the group in which the fibula was broken, two patients developed non-union and were subsequently treated with brace support; three amputations were necessary, two supracondylar in type and one below the knee.

Conclusions

This presentation has attempted to stress the basic methods of treatment, the average time of healing, and some comparison of results with the various types of fixation for tibial and fibular fractures.

As an outgrowth of our method of dividing patients with fractured tibias into those with, and those without, fractures fibulas, it is apparent that a more favorable outcome ensues in the case of a fractured tibia with the fibula remaining intact. Perhaps some thought should be given to stabilization of the fibula and an evaluation of this procedure as an adjunct to the other methods of treatment carried out.

Brain Injury Complicating Whiplash Injuries

A timely and provocative article, with medical legal implications.

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BRAIN INJURY, which may be permanent, as a complication of whiplash injuries has not been documented in the literature. The presence of cerebral concussion in 22 to 62 per cent of cases has been reported but no detailed neurological electroencephalographic follow-up has been recorded. Abbott[1] reported in 62 per cent there is historical and symptomatic evidence of a cerebral concussion. Frankel[2] reports with respect to cerebral concussion that "the deceleration injury may in a large number of cases (22 to 30 per cent) produce concussion to the frontal and occipital areas of the brain. Torsional forces may likewise involve the brain stem, the area of the brain just above the spinal cord. The symptoms range from loss of consciousness for varied period to confusion, dizziness, or vertigo, headache, inability to concentrate and disorientation. Some of the symptoms have been found to last for several years."

The purpose of this publication is to present forty-seven patients with whiplash injuries in whom detailed neurological assessment and electroencephalographic studies were carried out. In the majority of the patients, repeated electroencephalograms were obtained at varying periods from the time of the accident. Twenty-one of the forty-seven patients showed moderate to marked abnormalities in the electroencephalogram, some of which have persisted for longer than eighteen months after the initial injury.

Material and Method

The forty-seven patients were carefully selected in that all patients in whom there was a suggestion that the head may have been struck were omitted in the study, and the forty-seven cases represent patients who sustained the usual whiplash type injury. None of the patients with the exception of one (case 46) had a history of any pre-existing neurological disorders. All the patients were involved in automobile accidents with the majority being struck from behind and the head and neck subjected to a hyperextension flexion movement. In some patients, the vehicle in which they were passengers was struck from the side with a lateral to and fro motion of the head and neck being sustained. All of the patients were examined by one of the authors (S.K.S.) and all the electroencephalograms were interpreted by co-author (F.T.). The patients were consecutive cases of whiplash injuries seen during the period of this study and all electroencephalograms were taken with the patient off of any medication which might influence the electroencephalogram.

In the evaluation of the electroencephalograms, the usual criteria for abnormality was employed. Theta activity was considered abnormal in adults below twenty-five years of age when it constituted more than 10 per cent of the occipital, parietal and posterior temporal frequencies, when it was paroxysmal or when it showed higher voltage than the background activity. Any amount of theta activity exceeding 5 per cent of the activity in any area of the head was considered abnormal in patients over twenty-five years of age. Obviously the percentages are only approximate and are used here in order to give a general idea of our criteria for evaluation. Spikes, high voltage sharp waves and delta activity were considered abnormal. The electroencephalograms were classified as normal, minimally abnormal, mildly abnormal, moderately abnormal and markedly abnormal.

Results

The results of the electroencephalographic studies are recorded in Table I. The ages in this group of patients range from age sixteen to age sixty-six. Three of the patients were in their teens, eleven patients in the age range from twenty to thirty, fourteen of the patients from thirty to forty, ten of the patients from forty to fifty, six of the patients from fifty to sixty and three of the patients from sixty to seventy. Twenty-one of the forty-seven patients had moderate to marked abnormalities in the electroencephalogram at some time in the period comprised by this study. It should be noted that the presence of a normal electroencephalogram in some instances was followed by the development of moderate abnormalities in four of the patients. The patients who showed moderate to marked abnormalities in the electroencephalogram at some time in the course of their illness showed the following breakdown with respect to the time they had been followed from the electroencephalographic standpoint. Twelve patients had been followed for less than twelve months, five patients from twelve to eighteen months, three patients from eighteen to twenty-four months and one patient after twenty-four months.

From the clinical standpoint, there was considerable variation in the clinical course. In some patients, the onset of the symptoms was delayed for several days to weeks and in a minority as long as several months after the time of the accident. In the patients in this study, there was no prolonged period of unconsciousness in any of the patients. Some had a momentary loss of consciousness lasting for a matter of seconds, being followed by a sensation of being bewildered, dazed, dull or stunned. Headaches not infrequently were complained of within a few minutes or hours after the accident but in some instances the onset of headaches occurred days to weeks after the initial accident. Some patients described a blinding sensation or a sensation as if the top of the head were being blown off at the time of the accident. Psychoneurotic type of symptomatology in the form of tenseness, nervousness, restlessness, sleeping difficulty and easy excitability was frequently encountered. Many of the patients complained of vertigo, recurrent headaches, difficulty concentrating in addition to the persistent symptomatology in the neck. Reflex abnormalities in the upper extremity were not infrequently encountered. These could be explained on the basis of the injuries in the neck. Not infrequently transient changes in the abdominal reflexes were noted and transient toe signs were demonstrated. In the majority of patients the abnormalities in the toe signs and the abdominal reflexes usually returned in a matter of days to weeks to normalcy. In fourteen of the patients mild or minimal changes occurred in the electroencephalogram. This type of abnormalities found in these fourteen patients is similar to those encountered in about 15 per cent of the normal population by various authors.[3-4] However, some of the abnormalities became focal and shifted from electroencephalogram to electroencephalogram and when correlated with the clinical picture, were probably significant in some of these patients.

Two of the patients in this series presented

TABLE I.

	Sex	Age	Number of Days Following Accident EEG Taken	Degree of EEG Abnormality
1.	M	26	26	Marked
			103	Marked
			175	Marked
			273	Marked
2.	M	44	90	Mild
3.	M	20	412	Normal
			417	Mild
			469	Moderate
			570	Mild
			655	Moderate
4.	M	57	56	Normal
5.	F	39	620	Marked
			634	Marked
			718	Moderate
			750	Marked
			837	Marked
6.	M	18	163	Mild
			244	Mild
			299	Normal
7.	M	66	17	Moderate
			113	Moderate
			177	Moderate
			216	Marked
			251	Moderate
8.	M	43	110	Mild
			173	Normal
			271	Normal
9.	F	21	162	Mild
			316	Mild
			326	Normal
			400	Mild
10.	M	34	151	Normal
			164	Mild
			262	Mild
11.	F	16	365	Marked
12.	M	33	7	Mild
			62	Normal
			132	Moderate
13.	M	26	13	Moderate
			45	Marked
			175	Marked
14.	M	43	127	Mild
			142	Minimal
15.	M	38	96	Moderate
			134	Normal
			207	Normal
			260	Normal
16.	F	44	285	Mild
17.	F	57	51	Mild
18.	F	20	231	Moderate
			317	Moderate
19.	F	46	70	Normal
20.	M	43	82	Moderate
			120	Minimal
21.	M	38	130	Marked
			176	Marked
22.	M	52	13	Moderate
			59	Mild
			125	Minimal
23.	M	40	234	Moderate
			255	Mild

TABLE I—CONTINUED.

	Sex	Age	Number of Days Following Accident EEG Taken	Degree of EEG Abnormality
24.	F	34	18	Mild
			33	Normal
			50	Mild
25.	M	27	9	Mild
			25	Normal
			91	Moderate
26.	F	46	6	Normal
			46	Normal
27.	F	29	228	Normal
			245	Mild
28.	F	19	204	Moderate
			269	Moderate
29.	F	56	229	Moderate
			250	Mild
30.	M	34	9	Normal
31.	F	31	327	Normal
32.	M	60	737	Normal
33.	M	27	343	Normal
34.	M	23	20	Normal
			35	Normal
35.	M	36	35	Marked
			113	Marked
			162	Marked
36.	F	53	61	Normal
			114	Minimal
			149	Normal
			248	Normal
37.	F	28	257	Normal
38.	M	60	108	Marked
			323	Marked
			425	Marked
			681	Marked
39.	F	28	476	Minimal
			490	Mild
			572	Normal
40.	F	39	288	Normal
41.	M	30	157	Mild
			311	Minimal
42.	F	36	182	Moderate
			357	Marked
			427	Moderate
43.	M	33	17	Marked
			30	Moderate
			145	Moderate
			170	Marked
			371	Marked
44.	F	39	197	Moderate
			246	Normal
			316	Moderate
			414	Normal
45.	F	48	35	Moderate
			43	Moderate
			272	Moderate
			413	Marked
			491	Marked
			588	Marked
46.	M	47	54	Normal
47.	F	53	37	Marked
			51	Marked
			109	Marked
			155	Marked
			439	Moderate
			446	Moderate

features of unusual interest and a brief abstract of their case histories will be outlined.

Case History

Case 46.—This forty-seven-year-old patient was a front seat passenger in an automobile which was struck from behind by another automobile. The patient's head was thrown backwards and forwards. Immediately after the accident, the patient complained of pain in his neck and stated he became "pretty nervous." The headaches commenced about twenty-four hours later and the patient was awakened in the middle of the night with dizziness, nausea and vomiting. The next day the patient noted numbness of the left side of the face. He consulted his family physician and was admitted to hospital. Following admission to hospital, he continued to complain of severe neck pain, severe headaches, dizziness, numbness involving the left side of the face, disturbance of sensation involving the left eye and difficulty swallowing. When examined nine days after the initial accident, the patient had ptosis of the left upper lid, myosis on the left, decreased appreciation to pin prick over the complete sensory distribution of the left fifth cranial nerve, decreased corneal sensation on the left, mild involvement of heal to knee to toe test on the left, mild bilateral involvement of the finger to nose test, marked ataxia, mild decrease in appreciation of pin prick involving the right upper extremity, right side of the body and right lower leg, and dysarthria. At the time of the initial examination, he had moderate restriction of motion of the neck in all directions and moderate spasm of the paracervical musculature with moderate tenderness over the superior angle of the left scapula and over the long head of the biceps on the left. The left biceps reflex was absent while that on the right was present. The remainder of the reflex status was intact. The patient gave a history of previous neurological difficulty. At the age of five, he had had a fractured skull on the left side with penetration of the left side of the brain by a foreign object. Five years prior to his accident, he had had attacks in which the left leg lost strength and the left side of the face became numb and also at that time he had dizziness. Investigation at that time including angiography was negative and he had been free of symptoms for five years prior to the accident. In summary, the patient presented the clinical picture of a thrombosis of the posterior inferior cerebellar artery on the left. The patient has continued to have severe neurological residuals.

Case 45.—This patient was involved in the usual rear end type accident. She noted immediate sharp pain in the neck and was dazed and shaken up. In the evening of the accident, she awakened with severe pain in the neck and was unable to lift her head from the pillow because of the pain. Headaches were not noted until three weeks after the accident and they became of sufficient severity to waken the patient from her sleep. The neckaches and backaches persisted and the patient was hospitalized. While in hospital, some thirty-four days after the accident, the patient commenced to hallucinate. She stated that she overheard conversations about a patient being electrocuted. She became very disturbed, crying and expressing many paranoid ideas about the nursing staff and the conversations which they had been carrying on about her in the hall. It was necessary to move the patient to a locked unit. The psychosis responded to conservative treatment and cleared in a week. The patient has continued to have psychoneurotic symptomatology.

Discussion

The high incidence of brain injury as indicated by the moderate or marked abnormalities in the electroencephalogram may be in part due to the referred nature of the patients who were studied. If electroencephalograms are not obtained, no evidence will be forthcoming of the changes going

on in the brain in many instances and the doctor will be deprived of this valuable information. The brain injury may be purely mechanical. Due to the oscillations of the head and neck on a purely mechanical basis, injury can occur to the brain as it is brought into sudden contact with the skull. Another phenomenon in the production of brain injury is the acceleration or deceleration influences on the brain tissue as described in the experiments of Denny-Brown and Russell.[5] The third explanation for the brain damage encountered in this group of patients is on a circulatory basis due to a vascular insufficiency arising from involvement of the vertebral artery. Lewis and Coburn[6] have demonstrated by angiography constriction or occlusion of vertebral artery in patients in whom symptoms of rotatory ataxia, headaches, diplopia and unsteadiness of gait have persisted. The site of occlusion was at the second cervical level which is the point of greatest rotation of the head on the neck. Vertebral artery compression complicating whiplash injuries has become recognized as a complication of this type of injury.[2,7] Case 46 outlined above of posterior inferior cerebellar artery occlusion was probably on the basis of vascular insufficiency produced by involvement of the vertebral artery. This patient also serves to outline the fact that serious brain injury can be present in the presence of normal electroencephalogram. Patients who have pre-existing evidence of insufficiency of the vertebral-basilar artery systems or who have pathology in the vicinity of the vertebral artery can be expected to show a higher incidence of this type of complication following whiplash injuries. Frankel[2] noted that "arteriosclerosis, particularly of the vertebral artery, may make this artery more vulnerable to compression."

The majority of the authors who have written on the subject of whiplash injury recognize the presence of psychoneurosis as a complication of this injury. As an explanation of this psychoneurotic reaction, various theories have been advanced including: (1) hostility towards the driver of the other car is common and is often the basis of an emotional reaction; (2) frustration from an obvious or imagined lack of interest by the physician and accusation of malingering may produce a state of tension which protracts the period of pain and may lead to psychoneurotic reactions; (3) many patients develop a fear reaction over the knowledge of possible complications from injury to the spinal cord and brain.

It is of interest that injuries incurred in automobile accidents involving other areas of the body are not associated with the high incidence of psychoneurotic reactions encountered in the patients who have sustained whiplash injuries. For example, traumatic fractures of the lower extremities do not have the high frequency of psychoneurotic reactions and are infrequently seen in the office of a neuropsychiatrist. In view of the present study and the high incidence of abnormalities in the electroencephalogram, it is possible that in some patients at least the apparent psychoneurotic symptoms are organically determined and are symptomatic of the underlying brain injury. From the standpoint of treatment, the results of treatment of the psychoneurotic reactions in this group of patients who have persistent abnormalities in the electroencephalogram are less favorable than the group in which no abnormalities in the electroencephalogram are demonstrated. As outlined above Case 45 developed an acute psychosis following a whiplash injury in association with abnormalities in the electroencephalogram.

The majority of the patients in this study have been followed for too short a period of time to allow any final determination with respect to their brain injuries. It is hoped that this preliminary report will stimulate interest in this aspect of the problem of whiplash injuries so that additional data can be obtained. The combination of the clinical picture plus the electroencephalographic abnormalities in the four patients who have been followed longer than 18 months indicate that this group of patients has probably sustained permanent brain injury. The patient with occlusion of the posterior inferior cerebellar artery likewise has sustained permanent brain injury.

References

1. Gay, J. R., and Abbott, K. H.: Common whiplash injuries of the neck. J.A.M.A., 152:1698, 1953.
2. Frankel, C. J.: Medical-legal aspects of injuries to the neck. J.A.M.A., 169:216, 1959.
3. Williams, D.: The significance of an abnormal electroencephalogram. J. Neurol. Psychiat., 4:257, 1941.
4. Gibbs, F. A., Gibbs, E. L., and Lennox, W. J.: Electroencephalographic classification of epileptic patients and control of subjects. A.M.A. Arch. Neurol. & Psychiat., 50:111, 1943.
5. Denny-Brown, D. E., and Russell, W. R.: Experimental cerebral concussion. Brain, 64:93, 1941.
6. Lewis, R. C., and Coburn, D. F.: Vertebral artery: Its role in upper cervical and head pain. Missouri Med., 53:1059, 1956.
7. Seletz, E.: Whiplash injuries (neurophysiological basis for pain and methods used for rehabilitation). J.A.M.A., 169:216, 1959.

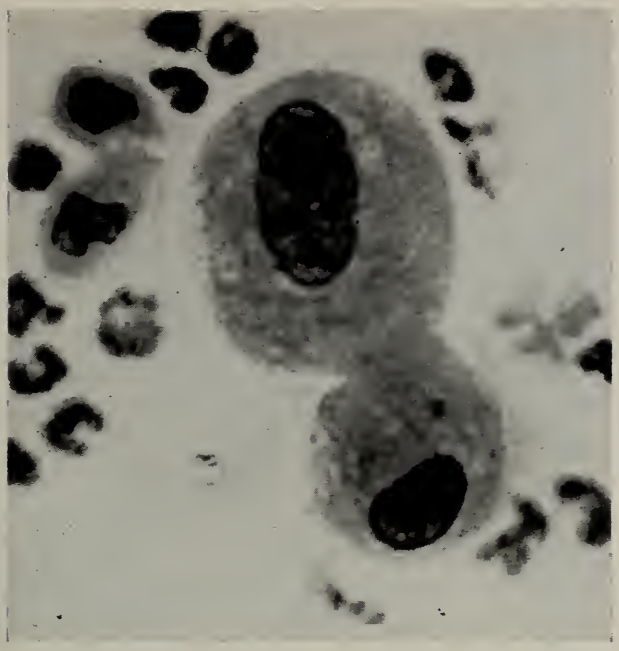


Fig. 1. Cells desquamated from an experimentally induced dysplastic reaction in the mouse cervix. Four weeks later, the animal was sacrificed with squamous cell cancer. × 1000

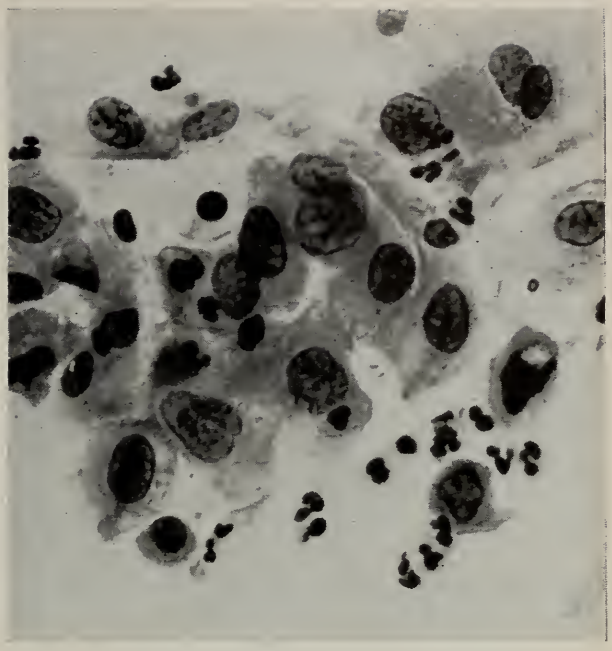


Fig. 2. Cells originating in a dysplastic reaction in the human cervix. × 500

The Cell as a Mirror of Disease

JAMES W. REAGAN, M.D.
Cleveland, Ohio

Read at the annual meeting of the Minnesota State Medical Association, Duluth, Minnesota.

THE CELL is one of the most interesting structures in the field of science. To the best of our knowledge, it has existed on the earth for several million years. Through the process, which is referred to as evolution, the Master Builder made many improvements in the cell. He has achieved the ultimate in the cells of man.

Even by the standards of the machine age, the human cell is a very remarkable unit. In the human manufacturing plant, there is nothing to suggest an assembly line. Under normal conditions each cell is organized so that it can carry out its own job independently, whether this is the production of some essential material, the disposal of waste, or only muscular contraction. The body is so organized that there is an excess of workers; however, unemployment is unknown. Rest periods are thoughtfully provided for by the management.

The organization of the cell is such that a sit down strike is almost impossible under normal conditions. One cell cannot prevent its neighbor from carrying out an essential function. The economy of the cell is illustrated by the fact that even in death the cells of the epidermis continue to serve a useful function, the protection of the human organism.

While the cell has been in existence for several million years, we have studied it for only about three centuries. The word "cell" was given to us by Robert Hooke. He first used the term in describing the structure of cork. Under his primitive microscope he commented on the small compartments or pores which he visualized. He called them "cells" because he thought that they were hollow spaces. The spaces in plant tissue are somewhat different from the cells of the human. Among other things plant cells have very thick walls. This is necessary to provide support in structures which lack a separate skeletal system.

The cells in the higher mammals are rather complex structures. It might be interesting to consider some of their components so that we can better understand the changes which disease may bring about in the cells.

The cell is composed of a mass of protoplasm and a nucleus. The protoplasm surrounding the nucleus is referred to as the cytoplasm. At the periphery of the cell are two membranes. The outermost is the true cell membrane which is not well developed in human cells. It is well developed in plant cells. Inside this is the so-called false membrane which is invisible with the light microscope and is concerned with cell permeability. The cytoplasm is made up of a substance called hyaloplasm. Inside this there are certain formed structures which are referred to as the organelles —the little organs. These occur in all cells and include the mitochondria, the golgi apparatus, the cell center, and in plants the plastids. We are concerned with the nucleus whose chromatin combines with the basic dyes. This is surrounded by a nuclear membrane inside of which is the nuclear sap. This colorless material lies between the twisted filaments of chromatin. The chromatin also occurs in larger masses referred to as chromocenters. Some of these masses are acidophilic and represent nucleoli. These are some of the basic morphological features of the cell. The study of Cytology is by no means limited only to morphology but also includes a study of cellular chemistry and cellular function. Since morphology and function are so often related, it is almost impossible to deal with only one to the exclusion of the other.

We can apply this knowledge in certain instances to determine the origin of a cell. Cells of polygonal form are usually of epithelial origin. The cells have this form because they can be packed together without any wasted space. Very thin and wafer-like cells occur on the surface of a many layered or stratified squamous epithelium. On the basis of their size and shape, we know that the cells are from a stratified squamous epithelium which serves a protective function. In some of the lower animals, these cells actually overlap one another like plates of armor. In the center of the cells there are pyknotic nuclei which tell us that the cell is dead. Other cells are prismatic in form and have a nucleus situated at one pole. Such forms are characteristic of cells with a secreting function. Cell function and shape are well correlated in the nerve cells with their long processes which are ideally suited for conduction. Thus, by looking at the shape of a cell we may get information about its function and also its origin.

Other cells are modified in certain ways to provide a very special function. These modifications are collectively referred to as the products of functional adaptation. These include the fibrils which are observed in squamous cells which we know now to be related to keratinization. Also represented are the cuticle, the cilia, the brush border, the myofibrils, the neurofibrils, and a related group of inclusions. All of these may be modified in the diseased cell.

Many physicians still find it difficult to accept the fact that cells may depict what is going on in their tissues quite accurately. This is somewhat difficult to understand because the pathologist has been accumulating knowledge of the cellular changes of disease for over 100 years. While most of this time he has been dealing with the cellular changes in the tissues, he also has been dealing with isolated cells. Detailed studies of the cells in the blood are made in order to determine what is going on in the marrow. Similarly, the sediment of the urine is examined in order to gain information about what is going on in the kidneys. Only for a little over a decade have we become interested in the epithelial cells and the information they can give us. In some instances, it is actually easier to detect minor changes by studying cells than by studying their tissues. For example,

hormonal changes are often more readily appreciated in cell preparations from the vaginal pool than they are in the parent tissues.

Even minor abnormalities of the epithelium can

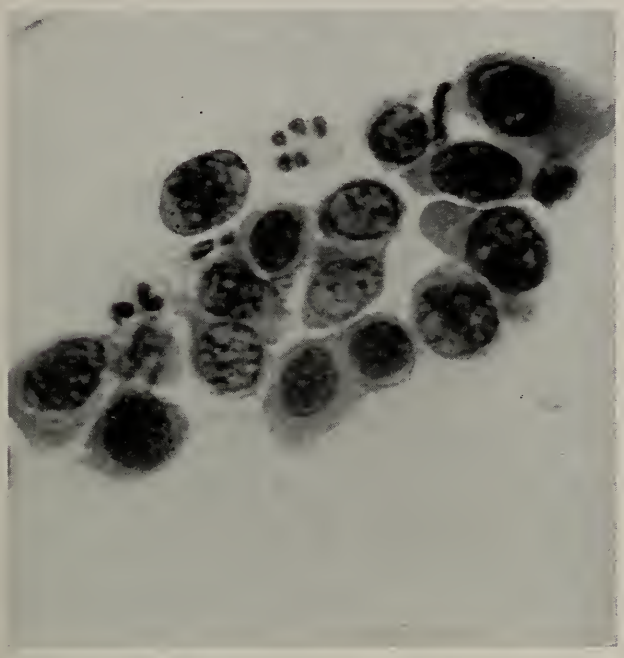


Fig. 3. Cells derived from a carcinoma *in situ* of the uterine cervix. × 500

be recognized by studying cells. Many different proliferative lesions can be demonstrated by examining the cells collected from critical areas.

The cells in Figure 1 are not human cells although they are thin wafer-like cells from a stratified squamous epithelium. They have very large nuclear masses and other structural changes which are associated with proliferating cells. They were observed in the vaginal pool of a mouse two weeks after a carcinogen-impregnated thread was inserted into the cervix. These cells are truly from a precancerous lesion because a keratinizing cancer was found four weeks later when the animal was sacrificed. On the basis of experimental work of this type there is definite proof that a significant surface change occurs in the cervix of the experimental animal prior to the development of cancer. By studying the cells which are shed, we can follow an animal through the stages of experimental carcinogenesis.

The cells depicted in Figure 2, which are from the human, have many of the features of the altered mouse cells. They have large nuclei and structural changes in the chromatin which are quite

significant. They may be associated with smaller red, orange, or yellow cells which have small dark pyknotic nuclei. These cells come from a change in the surface mucosa which we refer to as dysplasia

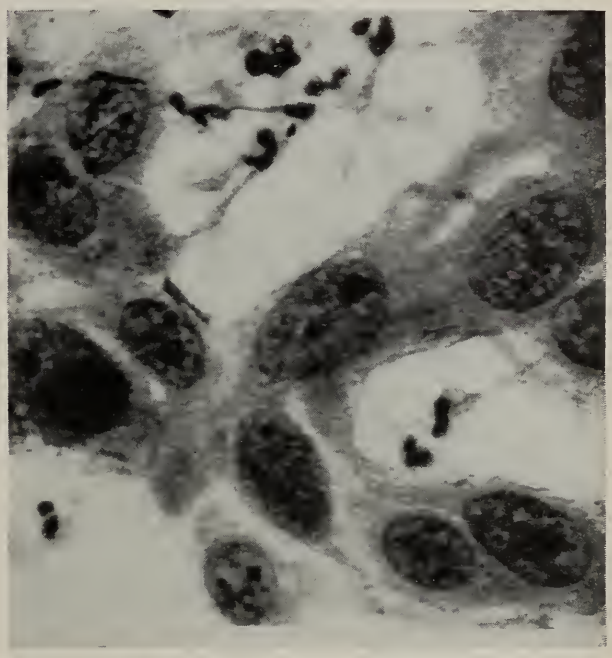


Fig. 4. Cells originating in a large cell non-keratinizing cancer of the uterine cervix. × 500

meaning malformation. The lesion occurs in the mucosa of the uterine cervix near the external cervical os and sometimes is observed over the portio vaginalis. About one in every 125 non pregnant women will have a change of this general type and the pregnant woman is even more apt to have such a lesion. Is this a precancerous lesion? Sometimes it does precede cancer. In many women this lesion disappears. This is the course of events in about 50 per cent of the women who are proved to have this change by biopsy. Biopsy in itself may remove the lesion in some cases. In about 35 per cent of the cases, it persists for varying periods of time and may recur even after it has been completely eradicated. In about 15 per cent of the cases, a more serious change is ultimately found. One might say that this is a potentially dangerous lesion.

The cells of Figure 3 are more omnious in their appearance. They are more immature and like primitive cells are usually associated with a high rate of cell division. The nuclei are relatively large in relation to the amount of cytoplasm. There are many people who believe that there is a high

likelihood for cancer to develop in women with these cells. They are from a change classified as carcinoma *in situ*. They were observed in a specimen taken from a thirty-two-year-old woman who consulted her physician because she was unable to conceive. The cervix was clean and a cellular specimen was collected as part of a routine examination. In our experience about four in every 1000 women will have this lesion.

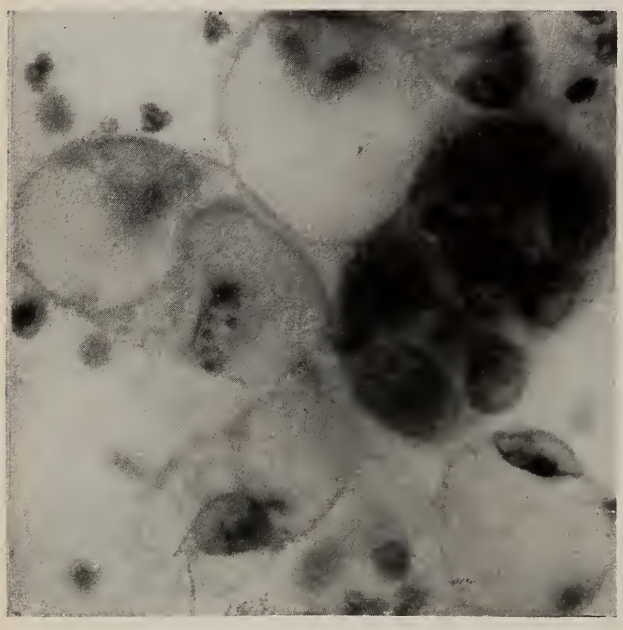


Fig. 5. Cells originating in adenocarcinoma primary in the uterus. × 500

The cells represented in Figure 4 are quite different. They are from the cervix of a sixty-four-year-old white woman who consulted her internist for a check up. Sixteen years ago she had a radical mastectomy for breast cancer and there was no evidence of recurrence. The cervix was described as being normal and nulliparous. A cellular specimen was taken as part of a complete pelvic examination. The cells were recognized as being from an epidermoid cancer of the uterine cervix. They lack the pleomorphism which characterizes the cells of keratinizing cancer and indicate the presence of a large cell non-keratinizing cancer. This form of cervical cancer has the best prognosis. The cancer which was found was a clinical stage I cancer of the cervix and this woman will survive two cancers in her lifetime.

The cells illustrated in Figure 5 are also cancer cells. They are different from the others that we have seen. They were found in the vaginal pool of a woman who went to her physician for a premarital examination. There was no history of abnormal bleeding and the cervix was described as normal. The large spaces represent secretion which indicates that the cells arose from a secreting epithelium and the parent lesion was an adenocarcinoma. Adenocarcinoma was found at D & C. Unfortunately, all of the adenocarcinomas do not shed their cells so readily. Endometrial aspiration increases the likelihood for demonstrating the cells of adenocarcinoma.

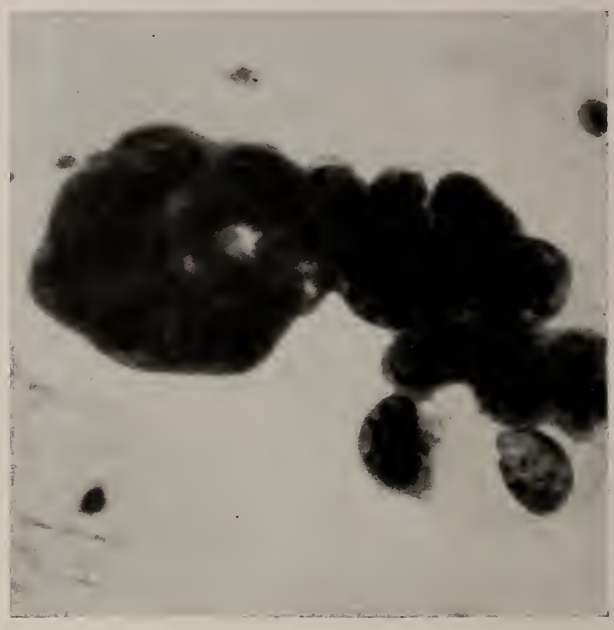


Fig. 6. Cells observed in aspirated material from the uterine cervix which are derived from adenocarcinoma primary in ovary. × 500

The cells in Figure 6 are also derived from adenocarcinoma and were found on a routine specimen in an eighty-four-year-old woman who complained of right lower quadrant pain and nausea. She had no post menopausal bleeding. These cells have some features which are suggestive of adenocarcinoma while other changes suggest that this is not a primary adenocarcinoma. These cells were reported as being from adenocarcinoma which was in all probability not primary in the uterus. She was ultimately proved to have a bilateral papillary adenocarcinoma of the ovary.

A knowledge of cells can be utilized in many different ways. One can search for evidence of tumor emboli in venous blood provide information about the radiosensitivity of a given cancer, and make other valuable contributions. Imprints of the tissues can be made to better study their cells.

Inclusions can be demonstrated in various cells. This includes large red inclusions of vaccinia and similar bodies observed in cytomegalic inclusion disease. Often it is desirable to establish the true sex of a patient as for example in Turner's syndrome. This can be determined by studying cells. The cells of the female have small planoconvex masses which are in relation to the nuclear membrane. They are called the female sex chromatin. When they are found in from 40 to 60 per cent of the cells scraped from the buccal mucosa there is evidence that the patient is female. They are not observed in cells of the male. There are many other applications for the study of cytology in the field of medicine.

For the most part, I have emphasized the cells related to the female genital tract, however, the approach is by no means limited to this site. It is used in many other areas with varying degrees of success.

I do not want to mislead you by considering only our accomplishments in dealing with cells without referring to our very real shortcomings. Even under optimal conditions cells are not always present in secretion from patients with cancer. The results are rather discouraging for adenocarcinoma of the corpus. Only about 50 to 80 per cent of the lesions will be detected by sampling the vaginal pool. It is possible to increase this accuracy only by aspirating directly from the uterine cavity. When this is done, 90 per cent of the adenocarcinomas can be demonstrated. The results in studying the uterine cervix are somewhat better. From 90 to 95 per cent of those women who have significant changes in the surface mucosa will have abnormal cells in specimens collected directly from the uterine cervix. While it is often possible to suggest on the basis of the cells the lesion which is present, this is not always the case. Our accuracy in recognizing the lesion referred to as carcinoma *in situ* was evaluated over a four-year period. Over this period of time, there were 137 consecutive cases of carcinoma *in situ* confirmed by histopathological study. Of these, 88 per cent were recognized as having cells which were compatible with carcinoma *in situ*. Conversely, however, of 127 consecutive cases which were studied cytologically and interpreted as being consistent with carcinoma *in situ* about 95 per cent were proved to be carcinoma *in situ* on histopathological study. Our shortcomings are by no means limited to a knowledge of cells. When we first became involved with the study of patients who had cellular evidence of abnormalities without a significant clinical lesion, the biopsy procedure was not as successful as we had once believed. Of 100 patients who were ultimately proved to have carcinoma *in situ* the initial biopsy confirmed the lesion in only 74 per cent of the cases. If it has done nothing else, cytology has indicated the need for improving biopsy technique.

This approach can be used effectively in many different ways. I am told that you in this state are planning a large scale screening program. In order to do this you will not purchase the latest book on cytology and get into business. It is much more complex than that. You must develop a whole team. The over-all success of the program depends on many individuals. The physician must be taught how to collect the specimen and in some cases this is the responsibility of a nurse or in institutions, a technical worker. If this is a large scale program, technicians must be trained to examine the material and screen out abnormal cases. In our own institutions, with a volume of about 30,000 cases or some 90,000 slides annually, it is physically impossible for me to examine each and every slide. I must depend on my very capable technical staff who incidentally do this job better than I could. The final decision must be made by the pathologist who must have experience in dealing with cells. Where an abnormality is found and biopsy is to be done, this must be individualized in each case because biopsy done for the purpose of demonstrating a lesion which is not apparent on inspection is quite different from biopsy in a woman who has an apparent lesion. Finally, the pathologist must be prepared to study the specimen comprehensively in many cases in order to detect some of these early lesions. According to vital statistics there will be about 26,000 new cases of carcinoma of the cervix this year and 12,000 women will die of cancer of the uterine cervix. Already there is evidence to suggest that this death rate can be and actually is being reduced by cancer detection programs and the procedures which are now available to us.

Since the cell mirrors the parent tissues from which it arises, a study of cells can be used to advantage in gaining knowledge about various critical areas in the human which are accessible. This is a very useful adjunct in diagnosis. It is not in any sense a substitute for good clinical judgement or for biopsy where indicated.

Remarks on Aging

Extension of remarks made at the annual meetings of the Northern and Southern Minnesota Medical Associations in Duluth and Rochester, September 11 and 14, 1959, respectively.

LEO A. NASH, M.D.
Saint Paul, Minnesota

IT IS NOW ESTIMATED that there are over 15 million people in the United States over sixty-five years of age which is approximately 10 per cent of the population. At the present time, this figure is growing at twice the rate of the normal population increase. Planning for solutions of the problems of aging is everybody's business. We as physicians have a tremendous responsibility in this matter since eventually the medical care of the aged becomes the primary consideration in dealing with this large segment of society. What factors have contributed to a longer life span and created these problems associated with aging? We may list some of these factors herewith.

Contributing Factors to a Longer Life Span

1. *Medical.*—Earlier diagnosis, the use of antibiotics and chemotherapy, improved surgical procedures and anesthesia and other forms of therapy certainly have contributed to longer life.

2. *Standard of Living.*—As a society, we have higher dietary and housing standards than several generations ago. These coupled with improved public health programs and better working conditions have contributed to this increase in the numbers of the aged.

3. *Urbanization, Economic Shift, and Change in Pattern of Family Life.*—While socio-economic in nature, these things have added much to the creation of the "problems of the aging population."

4. *Compulsory Retirement on Basis of Age Alone.*—While this is not directly related to the medical aspects of aging, it concerns us as citizens.

5. *Cost of Total Health Care.*—A higher incidence of illness is present in the older age group than in the rest of the population. With increasing services given in hospitals and nursing homes, associated with higher labor costs generally, the cost of institutional care has risen faster than the cost of living. It is held that physicians' fees as such have not risen similarly. The doctor's fee constitutes only a fraction of the total cost of illness, however this is rarely pointed out and we as physicians are identified almost always with the cost of total medical and health care.

What kinds of people and what groups are actively working in the field of aging? Some are:

1. *Scientists.*—These are sociologists, economists, psychologists, insurance actuaries, and medical scientists who are studying aging objectively according to their own disciplines.

2. *Dedicated Groups.*—These represent church and fraternal organizations, unions, professional groups and responsible individuals. Some two hundred nationally recognized organizations have been listed in this effort.

3. *Professional Social Workers.*—These include governmental and industrial representatives in the general field of welfare at various levels.

4. *Others.*—In this group we find politicians, representatives of reactionary groups, "do-gooders," and even those with a guilt complex. It has been stated that the problem of aging is essentially a political one, and will be solved by the people. We may for the present disregard the fact that in certain areas the electorate consists of as high as 25 per cent of the voters, but this has its implications.

Activities of Organized Medicine

The American Medical Association has recognized aging formally for only a few years with the establishment of a Committee on Aging, but was previously identified with the problem through the activities of other committees. It might be pointed out at this time that the term "geriatrics" has been replaced by the more inclusive term "aging" in reference to this subject.

Currently, the American Medical Association is very active in the field and sponsored a national planning meeting in 1958, co-sponsored a joint meeting with the American Dental Association, The American Hospital Association, and the American Nursing Home Association with

the establishment of a Joint Council in 1959. The American Medical Association is now sponsoring regional meetings in various parts of the country, the most recent being held in Minneapolis in October, 1959, with representation from Minnesota, Wisconsin, Iowa, North Dakota, and South Dakota. In 1958, the American Medical Association published a six point program for older citizens reproduced herewith.

AMA Six-point Program for Older Citizens

1. Stimulation of a realistic attitude toward aging.
2. Promotion of health maintenance programs and wider use of restorative and rehabilitative services.
3. Extension of effective methods of financing health care for persons over 65.
4. Expansion of skilled personnel training programs and improvement of medical and related facilities for older people.
5. Amplification of medical and socio-economic research in problems of the aging.
6. Leadership and co-operation in community activities for senior citizens.

Governmental Activities in the Field of Aging

Governmental activities in the field of aging are those at local, state, and federal levels. In Minnesota, Governor Freeman has sponsored two Governor's Conferences on Aging, in 1956 and 1959 and has established a Governor's Council on Aging with a full time consultant. The Minnesota State Medical Association is represented on the Council.

Federal Activities in the Field of Aging

These activities are implemented chiefly through the Department of Health, Education, and Welfare. In September, 1958, the 85th Congress passed Public Law Number 85-908 establishing a White House Conference on Aging to be held January, 1961. The purpose of the conference is to define the needs of the aged and to recommend proper legislation. At the present time, information is fragmentary as to the needs of the aged, derived often from isolated sources. Further at the federal level, the Senate Subcommittee on Problems of the Aged and Aging has held hearings to determine the nature of the problems in this area.

Activities in Minnesota in the Field of Aging

In addition to those previously mentioned, a rather well planned effort is being made in Minnesota at the present time in preparation for the White House Conference. This effort is implemented through the Governor's Council on Aging. A Health Committee has been established with subcommittees on rehabilitation, nursing homes, home care and financing. A five county survey on the needs of the aged in central Minnesota is underway. A study of farmers retired on Social Security, directed by a representative from the Department of Sociology of the University of Minnesota will be made. The American Association of University Women will survey some ten urban centers with a house to house canvass to determine the needs of the aged. These data will be published in a Fact Book, the cost of which will be underwritten by the Wilder Charities of Saint Paul. Regional meetings will be held and all of the information gathered will be presented at the Third Governor's Conference on Aging in the fall of 1960 for further classification and this information and these data and proper recommendations will then be presented by the Minnesota delegates to the White House Conference in January, 1961.

The Individual Physician and Aging

It is urged that every medical society, either county or regional, general or special and every other organization including groups such as hospital medical staffs incorporate in their programs discussions on the problems of aging to alert the individual physician to this which has been called Medicine's Number One Problem. Undeniably, whenever the problems of aging are discussed, the areas of housing, recreation, hobbies, employment, mental health, social adjustment and all else pale before the problem of medical and health care costs. We as physicians are identified with these costs and it is incumbent upon us to think about these matters individually and to discuss them collectively so that we as a group may make some positive suggestions to be presented eventually to the White House Conference in 1961. We hope that the Committee on Aging of the Minnesota State Medical Association together with other committees can formulate some positive ideas reflecting the thinking of the entire profession in Minnesota to achieve this aim.

Case Report



Fig. 1. Petechial hemorrhages on the arm and chest of a six-year-old girl. The purpura was caused by a hypersensitivity to Penicillin G.

Nonthrombopenic Purpura Associated with Penicillin Hypersensitivity

WARREN J. WARWICK, M.D.

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PENICILLIN was introduced to medicine in 1943 for the treatment of infectious diseases. Soon thereafter reports of various penicillin toxicities began to appear in the literature. Sporadically cases were reported of purpura associated with penicillin therapy.[1-23] Twenty-six such cases have been reported: one of thrombocytopenic purpura, the rest of the nonthrombocytopenic varieties, usually of the Henoch-Schönlein type, including one death associated with penicillin therapy and purpura. The following case is much milder than those previously reported in that the patient presented only purpura, and that later an immediate and delayed penicillin hypersensitivity was demonstrated.

Review of the Literature

The Henoch-Schönlein type of purpura caused by penicillin was described by Anderson[1] who, in 1947, reported the case of a thirty-seven-year-old man with transient swelling of the joints and subcutaneous tissues, toxic nephritis, and intestinal purpura following a second treatment with intramuscular penicillin. Mirabel[2] described angioneurotic edema, acute nephritis, and an urticarial skin rash with papules, petechiae, and ecchymosis, in a sixty-year-old man, starting about a month after his only treatment with intramuscular penicillin. Spring's[3] patient was a fifty-three-year-old man who developed abdominal pain, swollen joints, myalgia, nephritis, azotemia, the nephrotic syndrome, and a vesicular and macular purpuric skin rash after a single injection of penicillin. Piraino[4] presented the case report of a three-year-old with abdominal pain, nausea and vomiting, tarry stools, joint pains, urticaria, and a purpuric rash, after her third treatment with penicillin for otitis media. Jensen[5] found arthralgia, abdominal pain, melena, and a petechial rash in a twenty-seven-year-old man who received a single course of intramuscular penicillin. Casser's[6] case was an eight-month-old girl who had small purpuric lesions, with abdominal pain and brown emesis, following her second treatment with penicillin. Hadida's[7] eleven-year-old patient had an ulcerative pyoderma which had not responded to twenty days' treatment with tetracycline. The pyoderma cleared after four intramuscular doses of penicillin, but the patient developed arthritis, a petechial purpura, abdominal pain, vomiting, and intestinal hemorrhage. Van der Hoeden[8] cared for three patients who had intestinal bleeding after injections of penicillin.

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The work reported in this paper was supported, in part, by grants from Minnesota Heart Association and American Heart Association.

Dr. Warwick is Instructor in the Department of Pediatrics, University of Minnesota.

The first was a fifty-two-year-old man who during his fourth treatment with intramuscular penicillin developed an urticarial, petechial skin eruption and hemorrhagic feces. The second was a fifty-eight-year-old man with bronchitis whose asthma was activated and who developed bloody stools after receiving intramuscular penicillin. The third patient was a twenty-eight-year-old woman who received intramuscular penicillin for a dental abscess and who passed bloody, diarrheal stools within a few hours.

Other purpuric manifestations of penicillin sensitivity have also been reported. Price[9] noted petechiae and later urticaria, arthralgia, and fever in a Canadian Army driver while he was receiving a series of injections of intramuscular penicillin. Hinman, Warner and Li[10] described an urticarial and scarlatiniform rash which cleared, and then a severe, generalized, ecchymotic eruption in an eighty-five-year-old man after a course of intramuscular penicillin. Derzavis and Beinstein[11] recorded progressive changes from an erythematous, maculopapular to a hemorrhagic, vesicular to a gangrenous, ulcerative eruption in a fifty-six-year-old man, following several intramuscular injections of penicillin in oil and beeswax. Criep and Cohen[12] recorded three cases. Their first was a fifty-six-year-old man who had arthralgia, urticaria, angioneurotic edema, and purpura of the eyelids, lips and hands five days after inhalations of penicillin dust. Their second case was a fifty-one-year-old man with angioneurotic edema of the eyelids and hands, and generalized urticaria and purpura, following a third injection of penicillin in ten days' time. Their third case was a fifty-two-year-old man who had arthralgia, pruritus, angioneurotic edema of the eyelids, hands and feet, generalized urticaria and purpura, following his first treatment with intramuscular penicillin. Goetze[13] reported two cases. The first was in a fifty-six-year-old man who developed nonthrombopenic purpura after his second course of intramuscular penicillin. The other was a forty-year-old man who developed nonthrombopenic purpura after a course of intramuscular penicillin. MacGibbon[14] observed a twenty-eight-year-old man with nonthrombopenic purpura, nausea, diarrhea, pallor, dizzy feeling, apprehension, and malaise within a few hours after his first penicillin injection. Samitz et al[15] treated a forty-four-year-old man for subacute bacterial endocarditis with Penicillin G injections for sixteen days when petechiae developed on his arms, legs, and neck. These spread to his face and hands the following day, and then produced a hemorrhagic bullous eruption. He recovered when the Penicillin G was stopped and he later took Penicillin O without difficulty. Richter's patient,[16] a twenty-five-year-old man with chronic pyoderma, also developed a bullous eruption with hemorrhagic necrosis of the skin while receiving a course of intramuscular injections of penicillin. Stahl[17] found the development of large, bilateral hematomas in the thighs of a thirty-nine-year-old woman on simultaneous therapy with penicillin and Tromexan®. Témime and Carlin[18] gave their twenty-eight-year-old patient penicillin and terramycin for an acute pharyngitis—she had had penicillin and streptomycin the preceding year—with the formation of disseminated petechiae and a bullous skin eruption with hemorrhagic necrosis in some areas. Two intramuscular injections of penicillin, given for a cough, produced generalized petechiae and a bullous hemorrhagic skin eruption in the patient of Laugier and Renard.[19]

One case of thrombocytopenic purpura caused by penicillin has been reported. Krusius' patient,[20] a sixty-nine-year-old man, was chronically ill with cirrhosis, cystitis, and pyelonephritis. During one year, he had three courses of intramuscular penicillin. During the third treatment, he developed petechiae, ecchymosis, and epistaxis, associated with a platelet count of 14,000.

There are at least two reports of isolated prolonged bleeding time associated with penicillin therapy. Pillsbury, Steiger, and Gibson's patient,[21] a thirty-one-year-old woman, developed urticaria, laryngeal edema, and asthma while receiving post-surgical prophylactic penicillin. This was controlled with Benadryl® and Pyribenzamine.® Seventeen days later, she developed ecchymosis, vaginal bleeding, tarry stools, coffee-ground emesis, hematuria, bleeding gums, and a prolonged bleeding time. Frick, Wise, and Varco[22] reported the case of a forty-nine-year-old woman who had a hemorrhagic diathesis and a prolonged bleeding time, but with normal platelets and plasma coagulation factors, while receiving penicillin following surgery.

There has been only one case of a fatal purpuric type of reaction associated with penicillin therapy. Yeh's patient,[23] a thirty-six-year-old man, received intramuscular penicillin for an illness manifested by fever and swelling of the arms. After two days of treatment, he developed a hemorrhagic pur-

pura with peripheral gangrene, and despite blood transfusions and injections of vitamin K and ascorbic acid, he died two days later.

The case here reported of a purpuric penicillin reaction differs from the above because there were no complicating factors or other symptoms.

Case Report

This six-year-old white girl was first taken to a physician on March 17, 1958 because of malaise, fever, and enlarged posterior cervical lymph nodes. She was treated with Sulfose®, one tablet every six hours, and intramuscular procaine penicillin, 300,000 units daily for three days. She was then given tablets, 250,000 units of Penicillin G four times a day with the sulfa preparation. This was continued until April 4, 1958, when she developed a fever of 102 degrees and a generalized purpuric rash which was predominantly over her body and extremities, but not on her face. She was taken to the emergency room of the DeWitt Army Hospital, Fort Belvoir, Virginia. The physician in the emergency room discontinued medication with the penicillin and Sulfose® and gave instead aureomycin, 250 mg. three times a day. When next seen on April 7, 1958, the purpuric rash had faded from the body, was still prominent on the arms, and had spread to the face. Her temperature had returned to normal.

In the past, she had uncomplicated rubella, rubeola, and mumps, in addition to several upper respiratory infections, for some of which she had received penicillin.

Notable physical findings were a flushed face covered with numerous petechial hemorrhages. Petechiae were also present on her arms and chest (Fig. 1). Her white blood count was 4,500, with 50 per cent neutrophils, 49 per cent lymphocytes, and 1 per cent monocytes. The hemoglobin was 12.3 gm. per cent, and the platelet count 202,000. The bleeding time was 155 seconds, and the Lee-White coagulation time was ten minutes, thirty seconds. The urinalysis showed no abnormalities. A throat culture revealed no significant microorganisms, except for two colonies of Beta hemolytic streptococci (typing was not done), and a single blood culture was sterile. A Rumpel-Leede test was strongly positive.

On April 7, 1958, the white blood count was 3,450, with 42 per cent neutrophils and 58 per cent lymphocytes. No pathogens were found on throat culture.

On April 8, 1958 the white blood count was 3,300, with 24 per cent neutrophils, 66 per cent lymphocytes, 8 per cent monocytes, 1 per cent eosinophils, and 1 per cent basophils. Stool culture showed no enteric pathogens, but another throat culture grew out 2+ Beta hemolytic streptococci. The platelet count was 187,000, and the clot retraction was normal. The petechiae had almost completely disappeared.

A heterophile agglutination was positive in 1:112 dilution, but as a differential absorption was not done, the test was repeated. This time the heterophile agglutination was positive 1:56. The absorption with guinea pig kidney cells showed no titer, but absorption with beef red blood cells showed a residual titer of 1:25. The total protein was 8 gm. per cent. The electrophoretic pattern revealed 49.7 per cent albumin, 8.5 per cent $Alpha_1$ globulin, 9.5 per cent $Alpha_2$ globulin, 12.9 per cent Beta globulin, and 23.1 per cent Gamma globulin. An antistreptolysin-O titer was up to 833 Todd units. No C-reactive protein was found. The bone marrow was normal.

At the time of writing, fifteen months after the illness, the patient has continued in good health with no recurrent purpura.

In February, 1959, she was given an intradermal skin test with 20,000 units of aqueous penicillin after the method of Welch and Rostenberg.[24,25] Within a few minutes, she demonstrated an immediate hypersensitivity response. There was a two cm. area of redness, surrounding a one cm. edematous area which was surrounded by a 5 mm. blanched area. A single pseudopod extended from the central raised area to the edge of the erythema. Forty-eight hours later, there was a three mm. area of necrosis at the site of the injection with a surrounding one cm. area of erythema (Fig. 2).

Discussion

This is a case of nonthrombopenic purpura, not of the Henoch-Schönlein type. The causes of this type of purpura include certain acute infectious and chronic diseases, certain skin diseases, various forms of dysglobulinemia, avitaminosis C and P, some allergic processes, and a direct toxic action or an idiosyncrasy to certain chemical and animal agents.[26] Several of these diseases are implicated as possible causes in the case history: streptococcal infection, infectious mononucleosis, hyperglobulinemia, and the administered sulfa and penicillin.

The possibility that this could have been due to a streptococcal infection bears careful consideration. Andrews[27] described three cases of purpura and one case of Henoch-Schönlein purpura which occurred during an epidemic of scarlet fever. Each patient had symptoms of streptococcal infection, and from three of them Lancefield group A Beta hemolytic streptococci were isolated on throat culture. All had antistreptolysin-O titers which rose to very high levels. They also reported a case of Henoch-Schönlein purpura in a fifty-six-year-old woman with an ASO titer of 525 Todd units. Gairdner[28] also implicated the streptococcus as being important in the genesis of Henoch-Schönlein purpura. Eleven of twelve patients had a hemolytic streptococcus recovered from their throat during the active stage or later, with or without a definite infection. Unfortunately, he did not group the streptococci or make antibody determinations. One of his cases developed rheumatic carditis. However, Bywaters and associates[29]

found neither increased incidence of raised antistreptolysin-O titers nor an increased mean antistreptolysin-O titer when they compared a group of 19 children with Henoch-Schönlein purpura with forty similar non-rheumatic children. These contrasted sharply with the significant increase in both findings in 107 cases of acute rheumatic fever, all of which were under twelve years of age. Ten of their 28 cases of Henoch-Schönlein purpura had been given chemotherapy or penicillin lozenges for treatment of an upper respiratory tract infection before the onset of the purpura.

In this case, the elevated antistreptolysin-O titer is evidence of a recent streptococcal infection. Because the patient had received treatment with 1,000,000 units of oral penicillin and one gram of sulfonamides daily for two weeks, and then tetracycline 125 mg. four times daily for three days, it is unlikely that the streptococcus isolated was from Lancefield group A, as these streptococci are uniformly penicillin-sensitive. Unfortunately, this organism was not typed, so that this point cannot be established. That this purpura might have been the result of streptococcal disease remains a remote, but unlikely, possibility.

Mononucleosis was thought of as the cause for the purpura when a titer of 1:112 was obtained initially. The persistent absence of Downey type leukocytoid lymphocytes and the differential absorption indicating normal serum heterophile rule out this possibility.

The slight elevation of the total protein and the gamma globulin fraction suggested that hyperglobulinemic purpura was to be considered. The purpura, however, has not relapsed, did not appear chiefly on the legs, and it left no residual pigmented spots,[30] so her illness is distinct from that entity.

Hyperglobulinemia with macroglobulinemia[31] may occur and cause a severe, fatal, purpuric disease in elderly persons. The patient's age and the complete recovery rule this out, even though ultracentrifuge studies were not obtained.

The purpura in this case, therefore, appears to be the result of an acquired idiosyncrasy to one of her medications, the sulfonamides or penicillin.

The sulfonamides were eliminated because the recorded cases of purpura caused by sulfonamide, that is, the cases of Geiger's[32] and Bolton and Young's[33] have been of the thrombocytopenic variety, and because she has since taken Sulfose® without adverse effects.

Penicillin was implicated because of its known ability to cause nonthrombopenic purpura. The later demonstration of both immediate and delayed type hypersensitivity to 20,000 units of aqueous penicillin provide further confirmatory evidence.

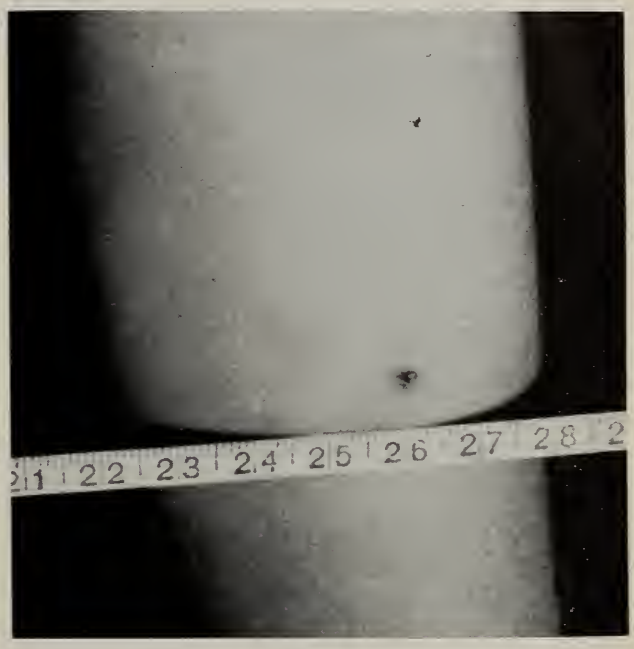


Fig. 2. Delayed sensitivity reaction forty-eight hours after the intradermal injection of 20,000 units of aqueous Penicillin G. There is a 3 millimeter area of necrosis, surrounded by a 1 centimeter area of erythema.

References

1. Anderson, A. B.: Anaphylactic purpura following intramuscular penicillin therapy. Med. J. Australia, 1:305, 1947.
2. Mirabel, L.: Penicillin hypersensitivity reaction with purpura of Schönlein-Henoch type, acute nephritis, and angioneurotic oedema. Proc. Roy. Soc. Med., 44:150, 1951.
3. Spring, M.: Purpura and nephritis after administration of procaine penicillin. J.A.M.A., 147:1139, 1951.
4. Piraino, A. F.: Schönlein-Henoch syndrome, with report of a case. Ann. Allergy, 11:332, 1953.
5. Jensen, B.: Schönlein-Henoch's purpura. Three cases with fish or penicillin as antigen. Acta med. scandinav., 152:61, 1955.
6. Casser, L.: Anaphylactoid purpura following penicillin therapy. J. M. Soc. New Jersey, 53:133, 1956.
7. Hadida, E., Timsit, E., and Bijaoui, G.: Purpura de type rhumatoide avec anémie survenu au cours d'un traitement pénicilliné. Bull. Soc. franç. dermat. et syph., 64:400, 1957.
8. Van der Hoeden, R.: Hémorragies intestinales consécutives à des injections de pénicilline. Acta gastroenterol. belg., 13:173, 1950.
9. Price, I. C.: Severe allergic reaction to intramuscular penicillin. Canad. M.A.J., 53:485, 1945.
10. Hinman, A. T., Warner, G. F., and Li, J. G.: Delayed reactions following penicillin therapy: preliminary report. California Med., 65:112, 1946.

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Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.

THE REVISED CURRICULUM

The revised curriculum for the junior and senior years of the University of Minnesota Medical School began on June 20, 1960, after a year and a half of planning. Exciting the revision was the need to eliminate the fragmentation and compartmentalization of the students' schedules which often enervated his senior year and reduced him to a passive, sometimes uninterested, bystander.

Dr. James B. Carey, Jr., was appointed curriculum coordinator, and with the heads of the medical school teaching departments formed a curriculum committee on January 15, 1959. On November 11, 1959, the recommendations were accepted for the revised medical school curriculum.

In the new curriculum the junior and senior years are a single period of twenty-four months, the junior-senior biennium. These two years are divided into blocks of time of which a total of twelve months is spent on in-patient clerkships, much as is done at present. There are also three months of elective time, three months free time, and a six month assignment to the Comprehensive Clinic Program to complete the twenty-four months.

These are referred to as block time assignments since the clerkships are interrupted by only one lecture a day, 4:00 to 5:00 p.m. These lectures are given the year around to the combined third and fourth year classes.

Another feature of the curriculum is the increased flexibility in the course of the individual student. Not only is there no rigid sequence of the required clerkships but the elective quarter permits some individualization of training. The student may use his elective time for course work, research, clerkship, or externship in any of the medical or pre-medical sciences and hospital services at the University or other medical schools. The block of free time may be used for vacation, but it is expected that many students will use that time to obtain a continuous six months for independent study.

The Comprehensive Clinic encompasses one-fourth of the students' last two years of medical school, and is the biggest of the curriculum changes. This part of the program is supported by a grant from the Louis W. and Maud Hill Family Foundation and is directed by Dr. Richard Magraw or Assistant Dean of the Medical School. The main objectives of the Comprehensive Clinic Program are to give the student doctor an active role in the care of out-patients similar to that given interns, to re-emphasize the patient as the unit of teaching and practice, and to improve patient care by making it possible for each patient to have a specific doctor who will integrate all of his care in the clinic until the patient is discharged or admitted to the hospital.

New patients admitted to the Adult Medical and the Pediatrics Clinic and private patients in North Clinic are assigned to the student doctors.

The student doctor, whenever feasible, initiates and completes the diagnostic and therapeutic aspects of his patient's care. The supervising staff physician will be the consultant, observer and teacher of the student at all times. When further consultation is required at a subspecialty clinic, the student is present as the patient's doctor and presents the patient to the consultant. Thus, in most situations, the student is the doctor to whom the patient looks for direction. It is expected that this more realistic and practical emphasis, the stimulus of responsibility, and the continuity of patient care will result in greater learning and will provide opportunity for the student to synthesize his knowledge of medical science and the phenomena of illness.

In order to promote this program, the Out-Patient Department has adopted a complete appointment system. Patients with appointments will be seen at the time of those appointments. Those without appointments will also be seen but in their turn. Of course, care of emergency cases has not been changed. Renewed emphasis has been given to the consultative role of the Out-Patient Clinics in returning patients promptly to the referring physician with detailed reports of diagnosis, treatment, and recommendation for care. Continued medical care is being given to those patients who require diagnostic or therapeutic facilities that are not generally available or who are participating in a clinical research program.

Warren J. Warwick, M.D.

THE WHITE HOUSE CONFERENCE ON AGING

Public awareness of the challenges and problems of our aging population has produced a number of diverse actions, the most significant and far reaching of which is the passage of Public Law 85-908 by Congress creating the White House Conference on Aging to be held in January, 1961. This act has compelled thousands of our citizens nationally to study, evaluate and consider the status of older people in this country and in turn report these findings at the White House Conference and make recommendations to the President which then will be made available to the public. Regardless of the genesis of this awareness, be it humanitarian, political or scientifically objective, the Conference should serve a real purpose. Short of a national election or a poll, it should reflect the thinking of the people. Delegates to the Conference will be chosen by state governors on the basis of population. Some 1,740 delegates will be selected this way together with 660 representing national voluntary organizations and some 400 others will be designated to attend by the Secretary of Health, Education and Welfare. Minnesota will have 36 delegates in the group of 1,740. The format of the Conference will center about twenty topics related to the field of aging; of these twenty, some eleven have either direct or indirect medical connotations. This appears to be proper distribution of topics since the most compelling problems of the aged have some medical implications or at least a health overlay coupled with costs. The presentation and study of these costs and the related problems as they apply to the aged have been described as the Number 1 Domestic Issue of the present time. The White House Conference of 1961 appears to be the most important large public gathering in the foreseeable future.

Nevertheless, critics and detractors of the intent and consequences of the White House Conference are something less than enthusiastic or optimistic about it. Why is this so? Cursory consideration of the issue reveals some answers promptly and patently. Since the electorate now consists of some 25 per cent of voters over sixty-five years of age and some 50 per cent over forty-five years of age, the issue thus is basically political. Further, the apathy manifest in certain areas toward the White House Conference stems from the real fact that information to date regarding the problems of the aged and aging has been fragmentary, emotionally inspired and not scientifically correct in terms of the real needs of this population group. It is thus feared by some that the data to be presented at the White House Conference will thus be emotionally tinctured if not politically tainted.

In Minnesota, elaborate studies are being made in anticipation of the White House Conference which will be made public on completion by the implementing agency, the Governor's Citizen Council on Aging. This Council is composed of some twenty-six individuals with representation from business, labor, education, medical and paramedical groups, clubs, voluntary organizations, public employees and officials, the latter group embracing the "professionals" in the field of aging and welfare. These individuals serve voluntarily. The severest critics have labeled some of them liberal extremists. This writer has not found this to be the case. Contrarily, they are kind, sympathetic, and both dedicated and orderly in their own disciplines. Is this not the thinking of the physician?

The ultimate selection of delegates to the White House Conference from Minnesota will be made by Governor Freeman; the actual selection will be made by a committee of the Governor's Citizens Council on Aging. We have scanty knowledge about the activities in other parts of the country, and we do not know if special interests will be served in the selection of delegates from other states, but it is our thinking that the philosophy of the people of Minnesota will be represented at the White House Conference. Further, in the interests of Minnesota, if there are any doubts of the twenty section chairmen at the White House Conference, four are from our state or natives thereof. Dr. Leonard W. Larson will chair the critical section on Health and Medical Care with other section chairmen including Dr. John E. Anderson of the Department of Psychology of the University, Mr. Walter E. Nelson of Minneapolis, and Mrs. Charles Hymes, President, National Council of Jewish Women, and the wife of a physician. Minnesota, Hail to Thee!

Leo A. Nash, M.D.

THE WORK EVALUATION UNIT

The Minnesota Heart Association has long realized the importance of the problem of employment of the cardiac patient in industry. The association felt the urgency of suggesting solutions to this problem and was certain it could be helpful in

this field. Extensive studies both in the field and in the literature indicated the vital role a work evaluation unit could play as at least a partial solution to this need. Several units of the forty-eight now operating nationally were visited to see first hand how they were conducted and what results they were obtaining.

These observations revealed that the units were effective in solving some of the problems of the cardiac patient and his work status.

The Minnesota Heart Association felt a project established on a pilot basis would be a worthwhile community service and professional education project. Consultations were held with the Heart Committee of the Minnesota State Medical Association and after considerable study this committee, and finally the State Medical Association itself, approved the project.

A nine-thousand-dollar annual budget was set up by our association to partially support the unit. The Kenny Institute generously provided us with space without charge, and offered some laboratory services at a minimal cost. Without the enthusiastic support of the fine staff at Kenny, it would have been far more difficult to establish and operate such a unit.

The Unit was established in March, 1959, and has operated on nearly every Wednesday since. Patients are accepted only on referral from private physicians. Various other professional disciplines are necessary for successful operation. Besides secretarial help it requires a cardiologist, a medical social worker, and a vocational counsellor, as well as other physicians.

The patient is interviewed by the social workers who determines the social background of the individual, his previous occupations, family problems, work motivation, and necessity for work. A general knowledge of his financial status is of considerable importance in determining both the need and motivation for employment. The vocational connsellor carefully interviews the patient as to his previous occupation, the work requirements of the job, and emotional pressures. He also determines the fitness of the employee to adapt himself to other vocations should that be necessary or desirable if the findings of the evaluation suggest the patient should change his vocation. The vocational counsellor's knowledge of the various agencies and the possibilities of assistance from them are very helpful. The counsellor's acquaintance with industries in the area willing to assist in the program of employing the handicapped individuals is often invaluable.

The patient then undergoes the medical evaluation. A complete history is taken by the physician. This includes not only the immediate cardiac history but also the past history of other medical conditions. An attempt is made to give an accurate evaluation of the history of the original attack and subsequent symptoms. The patient's symptoms, as they relate to ordinary activities of life such as dressing, bathing, walking, eating, are carefully recorded.

A complete physical examination is then performed. A chest x-ray, hemoglobin, and urinalysis is obtained, and a standard 12-lead electrocardiogram is taken. If the examining physician believes a standard exercise test is not contraindicated, this test is performed, using if possible the Double Masters two-step technique. If the patient develops pain or dyspnea during the test, the exercise is stopped and the usual post-exercise electrocardiogram is obtained. All the preceding information is then assembled and presented to the conference which consists of the director of the unit, one or more staff physicians, visiting internists, the social worker and the vocational counsellor.

In the discussion, the combined opinion and judgment of these individuals is obtained concerning the work potential of the patient. If he can perform the exercise test without symptoms or EKG changes, it is presumed that he can perform this amount of work (8.5 calories per minute) for a period of three minutes. The caloric requirements of most vocations are well known. Most of the usual industrial jobs require about 3.5 calories per minute with peak loads up to 4.5 calories per minute. Obviously, an individual who can perform 8.5 calories without symptoms or evidences of damage to his myocardium should have very little difficulty with these ordinary vocations.

However, if the patient cannot perform the standard exercise test, we know his work potential is below 8.5 calories per minute. These patients must at times be further evaluated. Dr. Frederick Kottke, Professor and Head of the Department of Physical Medicine at the University of Minnesota, has been helpful in this field. He has a workshop where individuals can be tested at various levels of activity and this has proved very useful to us. Following the testing in the laboratory, we are able very accurately to ascertain the level of safe activities for the patient. At the present time, we are

arranging with the Workshop at the Kenny Institute so that these evaluations can be made under our direction because the precise measurements available from Dr. Kottke necessarily must be limited to a small number of persons. These simulated work experiments are carried on for several hours thus giving the unit some idea as to the endurance of the patient.

With all this evidence in hand, the conference is then able to give an unbiased opinion about the work potential of the patient. We then frequently find the individual is able to resume his former employment. Under other circumstances, it will be necessary to have him seek a lighter form of work, for which he may need not only assistance in finding such a position but may need vocational training in order to be able to perform this new type of work. Certain patients will be found to be unable to perform any gainful employment, and this fact is then stated.

The Minnesota Heart Association has established a fee of $50 for this examination. No patient has been refused the services of the unit if he is unable to pay all or even part of the fee. The difference between fee collected and costs is underwritten as a public service by the Minnesota Heart Association.

The value of the service to the patient is considerable. Sometimes all the patient needs is the reassurance he receives by passing the examination. This alone will sometimes suffice to get him back into the industry. The fact that the determination is made by a group rather than by an individual lends reinforcement to the opinion already expressed by the private physician. The fact that the statement is unbiased makes it easier for the patient to deal with employers and others.

The value to the physician is two-fold. In the first place, he receives the benefit of a group opinion regarding the patient. Secondly, instead of being placed in the oft-time embarrassing position of being forced to state his position to the patient, he now can defer to the judgment of an objective impartial panel.

The community gains in several ways. Many cardiac patients can be returned to gainful employment instead of being the recipient of public support. The Cleveland Unit which has spent $100,000 on its unit in ten years has found that the wages earned by the patients returned to work during that time amounts to 17 million dollars. The unbiased opinion rendered by the group has made the employers more anxious to employ these individuals. Industry is usually willing to cooperate but wants security in the placing of the individuals. This group opinion gives them the assurance that if the cardiac is placed in accordance with the recommendations made, the industry will not be placed in an embarrassing position either from the standpoint of compensation or sickness and accident benefits. Labor which seeks to obtain employment for its members can also use this unbiased opinion to guide them. Certainly, labor does not wish to place the cardiac patient in a position dangerous to himself or to his colleagues. With this approach, labor finds itself in a better position to help its cardiac members.

It would seem that services afforded by the Work Evaluation Unit present a new approach to a long-standing and difficult problem and can be used to advantage by various groups of individuals. Wholehearted support of the Unit by these groups will do much to help the cardiac patient. We strongly urge that those interested contact the Cardiac Work Evaluation Unit, 1800 Chicago Avenue, Minneapolis, Minnesota. The telephone number is FEderal 9-9115.

A. C. Kerkhof, M.D.
President
Minnesota Heart Association

THE WATER SUPPLY AND SEWAGE DISPOSAL PROBLEM IN SUBURBIA

The extensive use of private wells and septic tanks in the suburban areas of the state is creating a serious threat to public health. A great many wells have not been constructed with care to prevent the entrance of surface water, nor located a safe distance away from cesspools, septic tanks and sewers, and thus have been contaminated directly with sewage.

Important, however, as proper location and construction are from the standpoint of health, these factors alone do not guarantee permanent safety in the use of individual water supply and sewerage systems in highly developed areas. The practice of drawing the water supply of the community from the ground beneath the community by means of numerous private wells, and returning the water to the ground in the form of sewage, obviously presents a condition which sooner or later may result in recirculation. In the early stages of this trouble, low concentrations of sewage chemi-

cals such as laundry detergents are found in the water. Later, these disturbances become more frequent and acute and the sewage chemicals may be accompanied by sewage bacteria. From time to time a great variety of toxic materials are disposed of deliberately or accidentally to sewerage systems. For this reason sewage contamination of the ground water is dangerous even in the early stages before bacteriological evidence is found. In one suburban community in the Twin City area, a survey has shown that approximately 1760 (60 per cent) of the individual water supplies in the community are affected in this way. Surveys in thirty-four other suburban communities have had equally startling results.

Since the effects of contaminated wells are usually limited to minor intestinal ailments, such as diarrhea, it is difficult to say how widespread contamination of individual water supplies is, but because such upsets are common and because they are usually caused by contaminated food or drink, it can be assumed that polluted wells are frequently at fault. There are numerous instances on record in which illness has been spread in this manner.

A great many septic tank systems also have been poorly designed and have been installed where conditions of soil and ground water are such that there is little if any possibility of successful performance. Failure of these systems results in pollution of the surface of the ground, causes noxious odors, and interferes with the operation of the entire plumbing system.

The health significance of sewage contamination of the ground surface is obvious. The avenues and vectors by means of which the organisms of those diseases transmitted through the fecal-oral route may be conveyed from exposed sewage to articles of food or drink can be enumerated endlessly. No one living in a community where private sewage disposal system nuisances are prevalent has the means of protecting himself against these hazards. One of the most startling examples of the difficulty that can arise from failure and abuses in the use of individual sewage disposal systems involves a small suburban community north of St. Paul. Of the 1400 residential establishments in that community, 800 have failed to the point where sewage is backing up into the plumbing fixtures and overflowing onto the surface of the ground.

The philosophy that developed communities can be served indefinitely by individual water supplies and sewerage systems is false. Such systems are basically intended for use in rural areas. The only proper permanent solution to the water supply and sewage disposal problem of built-up areas is the installation of central water supplies and sewage collection and disposal systems. In some cases this can be accomplished by an individual community independently. In other cases joint action by a number of communities may be necessary. Joint action, however, is sometimes hindered by a snarl of legal and philosophical obstacles. Appropriate legislation and a great amount of education will be necessary before many of these obstacles can be overcome.

F. L. Woodward

UNION OFFICIALS HAUNTED BY WORKERS' GROWING DEMAND FOR FREEDOM

A spectre is haunting the Jimmy Hoffas and the Walter Reuthers of this Nation—the spectre of right-to-work laws. They would like to believe their own oratory when they call it a "dead" issue, yet their still-strenuous efforts against right to work belie the fact that it is dead.

AFL-CIO President George Meany, for example, who confidently pronounced the funeral oration for voluntary unionism after the 1958 elections, told the delegates to the AFL-CIO convention in September, 1959, that the growing interest in state right-to-work laws is one of the three critical problems facing union officials.

What is the reason for this revival of pro-right-to-work sentiment?

Right to work continues to be a dominant issue simply because it protects a basic principle of human freedom, and human liberty cannot be continuously suppressed. Every tyrant throughout the course of history has experienced the relentless insurrection of human beings striving for freedom from oppression. The Big Labor bosses today are perched precariously astride that same relentless rebellion which takes shape in the demand that union membership, like membership in every other private organization, be made voluntary instead of compulsory.

The term "right to work" means that a person has the right to work for a living without being forced to join a labor union. Right-to-work laws are not against unions—but are only concerned with leaving the decision of whether or not to

join such unions to the individual workers. The motto of the National Right to Work Committee, therefore, is "Americans must have the right, but not be compelled to join labor unions."

Most present-day union bosses would take away that freedom of choice by compelling workers to join a union through "union shop" contracts. Since state right-to-work laws outlaw the so-called union shop, these laws naturally are the targets of the bosses' wrath.

A moment of reflection will show, however, that advocates of right to work stand in the American tradition of freedom. For throughout our Nation's history, its citizens have battled for freedom of choice, and against any form of compulsory membership in private organizations.

Take the early days of our Republic—the colonial period. At that time, the group known as "dissenters" led the fight for religious freedom, and for abolition of compulsory support of the established churches which existed in nine of the original colonies.

Three requirements existed for the citizens of those nine states. They were: (1) to attend the official church; (2) to pay taxes for support of the church; and (3) to adhere to the official church ideology. But resistance to this compulsion was so extensive, that by the time of the American Revolution only financial support through taxation was required of those citizens not members of the established churches.

The issue of such compulsory taxation resulted, in 1786, in the struggle over the Virginia Statue for Religious Freedom. It is worthy of note that the great orator, Patrick Henry, argued that since religion promotes happiness and prosperity for all, everyone should be compelled to contribute to the church. He advanced much the same "free rider" argument as today's union bosses, who claim that since unions allegedly help all the workers, every worker should be compelled to pay dues.

This reasoning was rejected by the Virginia House of Delegates, and eventually by all the other states. Instead, the states followed the reasoning of the Statute's author, Thomas Jefferson, who declared that "to compel a man to furnish contributions of money for the propagation of opinions which he disbelieves and abhors is sinful and tyrannical." The Statute for Religious Freedom was passed.

The issue of freedom of association again became a prominent issue at the beginning of the 20th Century, when the rise of Big Business really began. At that time, many employers forced their employees to sign "yellow dog" contracts, which stipulated that the worker could not belong to the newly-organized unions if he wished to get and keep a job. This was such a clear violation of the worker's right to organize to improve his working conditions, *and of his freedom of association,* that many states, and eventually Congress rightfully outlawed the "yellow dog" contract. Once again, Americans stood firm on the principle of the individual's right to belong or not to belong to private associations.

* * *

With this historical perspective, let us look at the present controversy over Right to Work laws. We find the situation to be the reverse of that which existed at the beginning of the century. Today the unions are strong and powerful, protected by both state and Federal law. Unfortunately, their professional leaders have fallen for the same philosophy of compulsion which first characterized the leaders of Big Business. They want to be given the right to force workers into their unions, and to pay dues which are used for politics and other purposes far removed from the issue of collective bargaining.

This changed outlook among the union bosses is best revealed by comparing the philosophy of Samuel Gompers, the founder and first president of the American Federation of Labor, with that of George Meany, the current president of the combined AFL-CIO. Gompers, at the 1926 convention of the AFL, told his delegates: "I want to urge devotion to the fundamentals of human liberty—the principles of voluntarism. No lasting gain has ever come from compulsion. If we seek to force, we but tear apart that which, united, is invincible." And it is "capital punishment," Gompers said, "if a union expels a member and he is deprived of a livelihood."

Contrast this with the philosophy of George Meany, as expressed just this last year: "I see no harm in power . . . if it is power for good." How many dictators throughout history have attempted to justify their power by such reasoning! Many Americans, however, would not agree with Mr. Meany's conception of what is "good." Nor would the majority of our Nation's lawmakers, who passed the Landrum-Griffin labor bill in the last session of Congress over the loud protests of Mr. Meany and other union bosses.

Or contrast Samuel Gomper's philosophy with that of Al Hayes, president of the International Association of Machinists, who upheld the expulsion of two California Machinists members for publicly supporting Right To Work in the 1958 campaign. An IAM member, says Mr. Hayes, is not entitled "to openly denounce the considered position of the labor movement and his own union organization without the possibility of losing his rights to retain his standing as an IAM member." In effect, he says, the freedom of speech guaranteed by the Constitution does not apply to you as a union member.

Such concentration of power in the hands of a union boss like Al Hayes could be tolerated if his union were completely voluntary, and only those who agree with him belonged. But over half of the Machinists' contracts have "union shop" provisions, so that protesting members find their jobs cut off by expulsion from the union.

There is one way, and one way only, to curtail such tyranny of union bosses over their members: enactment of Right To Work laws in every state of the Union. Under such laws, the worker who disagrees with the policy of his union, and who finds that there is no remedy within the union, can sever his membership without losing his job and his means of livelihood. And the union boss, under such a form of voluntary membership, would soon realize that he must pay attention to the needs and opinions of his members if he is to retain power.

Like most great movements, the right-to-work movement has been making steady, if not spectacular progress since the first state law banning compulsory unionism was passed in 1944. Today, nineteen states have right-to-work laws, and citizens groups are working actively for such legislation in several additional states. An informed public, given the facts, will eventually put an end to compulsory unionism in the United States. Freedom of association is the American ideal and the American practice, and it is for that reason that right-to-work will inevitably win.

W. T. Harrison

NONTHROMBOPENIC PURPURA

(Continued from Page 487)

11. Derzavis, J. L., and Beinstein, J.: Hemorrhagic gangrenous exfoliative dermatitis following penicillin in oil and beeswax; combined immediate and delayed reactions. M. Ann. District of Columbia, 17:32 and 69, 1958.
12. Criep, L. H., and Cohen, S. G.: Purpura as a manifestation of penicillin sensitivity. Ann. Int. Med., 34:1219, 1951.
13. Goetze, G.: Penicillinschäden nach Kapillartoxicose. Deutsche Gesundheitsw., 7:1488, 1952.
14. MacGibbon, J. B.: Anaphylactic and purpuric manifestations due to procaine penicillin G in aqueous suspension. Brit. M. J., 1:1196, 1955.
15. Samitz, M. H., Horvath, P. N., and Bellet, S.: A hemorrhagic bullous eruption due to penicillin G. Ann. Allergy, 8:377, 1950.
16. Richter, R.: Zur Kenntnis und Pathogenese des Sanarelli-Schwartzman-Phänomens der Menschlichen Haut. Hautarzt, 5:243, 1954.
17. Stahl, H.: Tromexanblutung in Penicillinexanthem. Gynaecologia, 139:184, 1955.
18. Témime, P., and Carlin, J.: Purpura anaphylactoide nécrotique par allergie probable aux antibiotiques. Bull. Soc. franç. dermat. et syph., 65:222, 1958.
19. Laugier, P., and Renard, R.: Lésions érythématobulleuses, purpuriques, généralisées, après administration d'antibiotiques: phénomène de Sanarelli-Schwartzmann? Bull. Soc. franç. dermat. et syph., 64:83, 1957.
20. Krusius, F. E.: Thrombocytopenic purpura accompanying penicillin therapy. Ann. med. int. Fenniae, 36:531, 1947.
21. Pillsbury, D. M., Steiger, H. P., and Gibson, T. E.: The management of urticaria due to penicillin. J.A.M.A., 133:1255, 1947.
22. Frick, P., Wise, R., and Varco, R.: Temporäre hämorrhagische Diathese nach Penicillintherapie. Schweiz. med. Wchnschr., 87:1587, 1957.
23. Yeh, F.: Peripheral gangrene and hemorrhagic purpura due to penicillin sensitivity: Report of a fatal case. Chin. M. J., 76:599, 1958.
24. Welch, H., and Rostenberg, A., Jr.: Hypersensitivity of the tuberculin type to crystalline penicillin sodium. J.A.M.A., 126:10, 1944.
25. Rostenberg, A., Jr., and Welch, H.: A study of the types of hypersensitivity induced by penicillin. Am. J. Med. Sc., 210:158, 1945.
26. Wintrobe, M. H.: Clinical Hematology. Philadelphia: Lea and Febiger, 1956.
27. Andrews, V. M.: Antistreptolysin-O titres in allergic purpura and related diseases. Am. J. Med. Tech., 20:97, 1954.
28. Gairdner, D.: The Schönlein-Henoch syndrome (anaphylactoid purpura). Quart. J. Med. (New Series), 17:95, 1948.
29. Bywaters, E. G. L., Isdale, I., and Kempton, J. J.: Schönlein-Henoch purpura: Evidence for a Group A Beta-Haemolytic streptococcal aetiology. Quart. J. Med. (New Series), 26:161, 1957.
30. Wilson, S. J., Bolinger, R. E., and Slinker, B. J.: Hyperglobulinemic purpura. J. Kansas M. Soc., 58:166, 1957.
31. Quattrin, N., Dini, E., and Piccoli, P.: On the differential diagnosis and pathogenesis of the purpuras with hypergammaglobulinemia or macroglobulinemia. Acta med. scandinav., 156:25, 1956.
32. Geiger, J.: Thrombocytopenic purpura induced by sulfisoxazole (gantrisin) therapy. J.A.M.A., 149: 1219, 1952.
33. Bolton, F. G., and Young, R. V.: Observations on cases of thrombocytopenic purpura due to quinine, sulphamezathine, and quinidine. J. Clin. Path., 6: 320, 1953.

President's Letter

IT WAS A GOOD MEETING

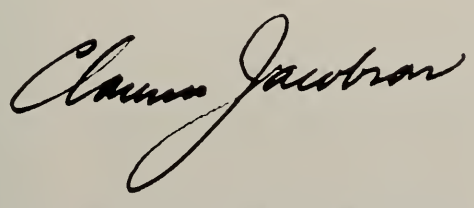
The prevailing consensus has been that our Association enjoyed one of its outstanding meetings this year at Rochester. The Zumbro Valley Medical Society put forth their best efforts and succeeded in making the event a significant one. They deserve and are extended the thanks and appreciation of the profession.

It was indeed a well executed and informative scientific program, covering the latest advances applicable to everyday practice. We hope that members will continue to suggest ways and means to the state office for further improvement of our programs. This should be done before the Committee on Scientific Assembly meets in October. This committee constantly seeks to meet the prevailing demand for a program which will maintain a high scientific standard and at the same time answer the need of the doctor in his practice.

The House of Delegates seemed better informed on the many vital issues placed before them from the various reference committees. A spirit of mature insight and restraint in discussing controversial problems appeared to prevail throughout the entire meeting. Matters at hand were resolved without rancor or needless discussion. Intelligent decisions can only be made on resolutions received early by the state office. However, in fairness to everyone, an arbitrary deadline has not been advisable. The consequences are nevertheless apparent. Deliberation by each delegate on the content of each resolution is obviously desirable in order to render a fair decision.

Committee reports represent conscientious work and reflect the unity in medicine's efforts to maintain a profession free to act in the best interest of people entrusted to our care. Our opposition to the expedient measures before Congress were manifested in action during this session. The messages sent to our Congressmen and Senators were the opinions of the individual doctor and no doubt gave them food for thought before embarking upon a reckless course of action. Appealing to intelligent appraisal appears to have had a salutary effect.

State Association meetings of the quality we have enjoyed can only be continued in the environment of freedom. Minnesota physicians have continued to be informed regarding the many devious efforts to divert them from their avowed purpose. Truly they have responded with a determined will to prevail.



President, *Minnesota State Medical Association*

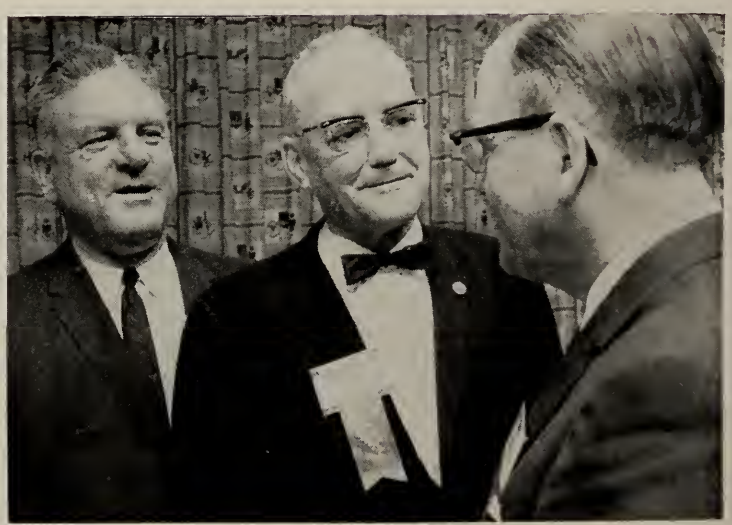
Minnesota State Medical Association



DELEGATES MEET—The House of Delegates of the Minnesota State Medical Association is shown in session in the Royal Coach Room of the Kahler Hotel. Presiding over the meeting at right is Dr. Haddon Carryer, Rochester, speaker of the House.



SPEAKERS—Rep. Thomas B. Curtis (R-Mo.), a key figure in the House Ways and Means Committee, left, was a featured speaker May 23 at the House of Delegates banquet. Dr. Haddon M. Carryer, right, of Rochester, is speaker of the House of Delegates.



NEW OFFICERS—Among officers of the Minnesota State Medical Association elected at the closing session of the House of Delegates are, left to right: Dr. J. M. Stickney, Rochester, delegate to the American Medical Association; and Dr. C. L. Oppegaard, Crookston, president-elect. Dr. Clarence Jacobson, Chisholm, at right, is current president who retires December 31.

. . . 107th Annual Meeting Highlights

A total of 2,538 persons, including 1,209 physicians, were registered for the 107th Annual Meeting of the Minnesota State Medical Association, May 23, 24 and 25, 1960, in Rochester. Scientific sessions were held in the Mayo Civic Auditorium and the Business sessions of the House of Delegates were held in the Kahler Hotel.

A number of significant actions and items of business were considered by the House of Delegates.

Blue Shield Resolutions Considered

There were seven resolutions from county societies and specialty groups, all dealing with some phase of the operation of Blue Shield in Minnesota or with the handling of professional services of doctors in the hospitals. Two of these received consideration and action on the floor of the House. The other five were referred for consideration by the Council.

Dr. C. L. Oppegaard, Chairman of the Council, reported to the House of Delegates that the Council and the Board of Directors of Blue Shield are very close to agreement on the points of difference between the two groups. Delegates were told that the Blue Shield Board has agreed that representation on the corporate body for every county medical society in the state is essential.

Still to be determined is the method to be used for the selection of the incorporators. It was suggested that Blue Shield take immediate steps to appoint a special committee of the Board to develop and submit proposals to the Council of the Association. Doctor Oppegaard told the Delegates there was good reason to believe the matter would be settled satisfactorily.

In other Blue Shield actions, the House of Delegates authorized Blue Shield to negotiate with labor and management on new contracts which vary from standard Blue Shield programs and involve higher ceiling limits on income and payments to doctors. The action was the result of a resolution submitted by the Range Medical Society which includes the northern part of St. Louis County, also Itasca and Koochiching counties.

It became evident during the course of discussion that the plans approved would serve as a pilot plan in an area where negotiations with mining and steelworkers unions often require immediate action.

The sponsors of the resolution indicated that approval of such emergency negotiations would be of benefit to both medicine and labor. The House of Delegates, in giving its approval to the pilot plan, said that Blue Shield could negotiate with labor and management only if the final contract, in all of its terms, were approved by the local medical society and the Council of the Minnesota State Medical Association.

Dr. Clarence Jacobson, Association President, pointed out to delegates that the development would provide patients with a wider freedom of choice of doctors. According to Doctor Jacobson, a practicing physician in Chisholm, counties in the Iron Range country have had good relations with labor and they should be continued.

In addition to the Range resolution, the delegates considered the resolution introduced by the Ramsey County Medical Society. The resolution from the Ramsey County Medical Society was unanimously adopted by the House of Delegates as follows:

> WHEREAS, the physicians of Ramsey County most strongly insist that professional service rendered by physicians and the arrangements for payment for medical service must remain under the direction of doctors of medicine,
>
> THEREFORE, BE IT RESOLVED, that we most strongly insist that the Blue Cross not extend out-patient coverage in the form of diagnostic procedures to their subscribers.

The remaining resolutions were referred to the Council for further consideration.

Miscellaneous Resolutions Considered

Among resolutions in other fields which received unanimous sanction of the delegates was one from the Zumbro Valley Medical Society which proposed to recommend to the United States Postmaster General the printing of a commemorative stamp memorializing Drs. William J. and Charles H. Mayo.

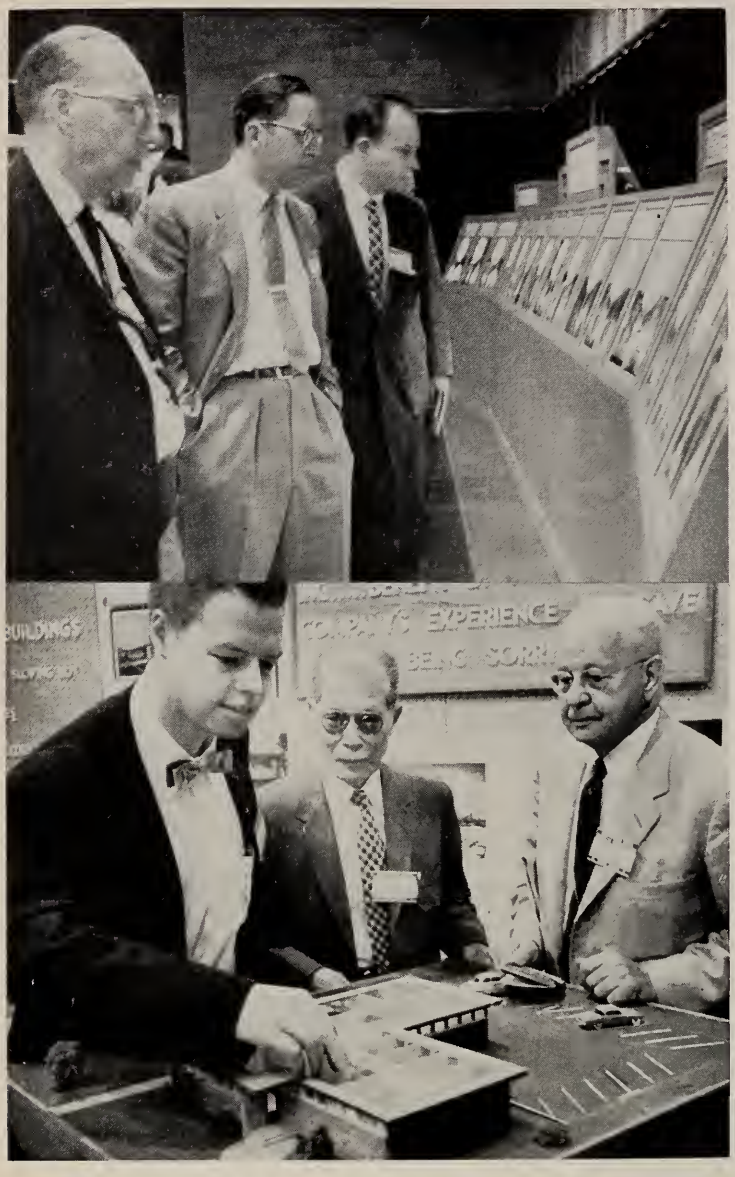
Another called for a poll of members on the question of compulsory Social Security coverage for physicians. A new poll on the question was ordered by the delegates and will be conducted this year. This will be the third such poll conducted in the last five years by the Association.

Saint Paul Medical School Approved

Still another resolution called for approval of the Minnesota State Medical Association for a possible new medical school in Minnesota.

The resolution pointed out that:

1. The American Medical Association, the Association of American Medical Colleges, the Surgeon General's



SCIENTIFIC EXHIBITS FEATURED—Viewing a scientific exhibit *(above)* at the Auditorium sponsored by the Mayo Clinic and Mayo Foundation are, left to right, Drs. M. J. Lindahl of Sherburne, A. F. Johnson of Isle, and Alex Lowe of South St. Paul. A scale model of a hospital, *(below)* complete with parking lot and miniature cars, attracted the attention of three physicians attending the annual meeting of the Minnesota State Medical Association. Admiring the display, one of more than 100 set up in the Mayo Civic Auditorium Arena, are, left to right, Dr. Karl Helwig of Kerkhoven, Dr. Kano Ikeda of St. Paul and Dr. F. H. Magney of Duluth.



MEDICAL AUXILIARY OFFICERS — Mrs. M. F. Fellows of Duluth, left, retiring president of the Woman's Auxiliary to the Minnesota State Medical Association, was succeeded by Mrs. W. P. Gardner of St. Paul, second from right, in an election at the 38th annual meeting of the auxiliary at the Kahler Hotel. Second from left is Mrs. W. A. Merritt of Rochester who was elected president-elect of the state organization. Mrs. Martin VanHerik of Rochester, right, is the new president of the Zumbro Valley Medical Auxiliary.

Special Committee, and many other authoritative sources have pointed out the shortage of medical manpower that will develop in the United States during the next two decades.

2. The consensus of this authoritative opinion is that approximately twenty new medical schools must be established to diminish this shortage.

3. These twenty medical schools must be established in addition to the complete expansion of present medical school facilities and the City of St. Paul and the State of Minnesota have been adjudged as a favorable climate for medical education.

4. Sufficient clinical material has been demonstrated to be available in the Twin Cities to support an additional medical schools teaching program.

The Ramsey county sponsored resolution urged that the Minnesota State Medical Association go on record as approving the establishment of a new medical school in the state, and further be it resolved that the Minnesota State Medical Association cooperate with any well organized effort toward the establishment of a new medical school in Minnesota.

Annual Meeting Changes Aired

One of the major tasks of the 1960 session was the final consideration of a report prepared by a special committee created by the Council to study and evaluate annual meeting procedures. This committee was appointed as the result of comments voiced in the 1959 session and the report also considered the criticisms and suggestions made at that time. The project was previously referred by the Council to a special Reference Committee of the House which reported on Monday, May 23.

Dr. John L. Falls of Red Wing was Reference Committee Chairman and the following actions were taken on the basis of recommendations of his committee and discussions from the floor of the House.

1. That House of Delegates sessions should begin on Saturday instead of Sunday, which is the customary day, in order to give more time for reference committee deliberations.

2. That the annual President's Address should be given at the first session of the House, just preceding the report of the Chairman of the Council.

3. That all resolutions should be sent in to the Speaker thirty days before the delegates' sessions convene in order to give time for the delegates to bring them to the attention of their county medical societies: That the name of the individual or society concerned be given and that the Reference Committee to which the resolution is referred hold a preliminary meeting at which those who are in favor and those who are opposed can be heard; also that the State Association provide legal consultation on the resolutions so that committees will be aware of legal implications in all instances and that all reference committees hold executive sessions, after the open hearings for the purpose of preparing their reports for the House of Delegates; further, that only portions of the reports which require action be read from the rostrum and that the remainder of the reports be duplicated and distributed to the delegates; that all committee chairmen be required to be present at the reference committee meetings where their reports are discussed; also that all non-functioning committees be eliminated.

4. That the President of the State Association should preside and that Fifty Club members be called on by name and that they be asked to stand but not be required to walk to the speaker's table.

5. That prizes, scholarships and recognitions, except for the Distinguished Service Award, be announced in the House of Delegates instead of at the banquet.

6. That the Chairman of the Committee on Local Arrangements be a voting member of the Committee on Scientific Assembly and that meetings of the latter be arranged so that he can attend.

7. That time limits be enforced on speakers at the scientific sessions.

8. That it is not the province of the reference committee to decide the place of scientific sessions in the over-all picture but that suggestions should be sent to the Committee on Scientific Assembly (which is a continuing committee) and evaluated for possible future adoption.

9. That a permanent committee of the House of Delegates should be created and instructed to evaluate and re-evaluate the official structure of the Association, since time available to the reference committee was too short to deal adequately with the numerous problems involved. Appointment of the new committee would be made by the Speaker of the House and the Council and representation should sufficiently include enough to cover all areas of the State. It was pointed out that nominations for officers are now governed by the By-Laws and it was understood that the question of nominations should not be referred for evaluation to the new committee.

10. That Duluth be eliminated as a regular meeting place until such time as adequate facilities are available and with the hope that they will be made available soon.

A resolution calling for the meeting to be held in St. Paul and Minneapolis, only, was rejected by the delegates. The committee also recommended, and it was unanimously approved, that other resolutions with respect to official structure, including representation for some officials from rural areas, be referred to the new committee of the House for study.

Doctor Dale Heads Public Policy Committee

Dr. Les N. Dale of Red Lake Falls was named Chairman of the Committee on Public Policy for the next biennium by the Council and the choice was ratified by the House of Delegates. Doctor Dale will fit the duties of this post which he has held since 1956 to the demands of a busy medical practice.

New Student Loan Fund Established

A new permanent loan fund for medical students at the University of Minnesota was established by the House of Delegates. On recommendation of the Council, approximately $13,000 was appropriated by the delegates for this fund and it will be available at low interest rates for students who have exhausted all of the loan possibilities made available to them through other sources and who might otherwise be obliged to abandon their careers in medicine.

At the same time, final details were agreed upon for an emergency loan fund to be called the "Herman M. Johnson Emergency Student Loan Fund" which will be used for short-term loans to tide medical students over financial crises. It will be available in amounts up to $200 without interest for periods of ninety days. A total of $4,000 has been appropriated for this fund of which $3,100 is



AWARD WINNER—Dr. Bror S. Troedsson, Minneapolis, is shown at his booth which won an award as the best scientific exhibit at the Minnesota State Medical Association meeting. Dr. Troedsson was presented a medal at the annual banquet Tuesday night. The exhibit depicts oscillometric arterial circulatory norms.



DISTINGUISHED SERVICE AWARD WINNER—Dr. William H. Hengstler received the distinguished service award for contributions to the welfare of the Minnesota State Medical Association and medicine in general, as chairman of the medical advisory committee since 1940. Since he returned from World War I in 1919, Dr. Hengstler has practiced in St. Paul as a physician and neurologist. He is a member of the staffs of several St. Paul hospitals.



FIFTY-YEAR PHYSICIANS HONORED — Three of the physicians who were cited for fifty years of practice at the Minnesota State Medical Association dinner Tuesday night are *(left to right):* Dr. Martin Larson, 76, St. Paul; Dr. Herman Kesting, 77, St. Paul; and Dr. F. E. Ellison, 76, Monticello.

a transfer of the Herman M. Johnson Fund held by the Association for many years. It is to be used for an appropriate memorial to the late Doctor Herman M. Johnson of Dawson. Doctor Johnson was a University Medical School graduate, a former president of the Association and first chairman of its committee on Public Health Education. Members of Doctor Johnson's family joined with the doctors in hearty approval for use of the fund as an appropriate memorial to Doctor Johnson.

Impartial Medical Testimony Plan Approved

On recommendation of the Council, the delegates also approved a plan for selecting panels of impartial medical experts to be turned over to the district judges of the state for their use whenever they feel there is any question as to medical testimony offered in their courts, or in pre-trial hearings. This is, essentially, the plan for impartial medical testimony which received preliminary approval by the House of Delegates last year. The experts will be picked by balloting under supervision of the Committee on Medical Testimony.

Interprofessional Relations Code Approved

Approval was also voted with a minor alteration, on Council recommendations for a Code of Interprofessional Relations for use of doctors and lawyers of the state. The code must still receive the final approval by the Minnesota State Bar Association at its meeting in July.

Another pilot operation in work evaluation to be carried on at the Kenny Institute in Minneapolis was also approved. This plan will provide work evaluation reports for patients with pulmonary disabilities and will operate in much the same manner as the pioneer unit for heart patients.

Labor Relations Function Added

A new function was added to the Committee on Labor Relations, recently created subcommittee of the Committee on Medical Service, with approval of the House. The committee will serve as a meeting ground for representatives of employers, of unions and of the doctors, to arrive at policies and iron out differences in administration of employee medical care plans and fringe benefits. Preliminary meetings of these groups have shown the value of such a committee.

New Officers Elected

C. L. Oppegaard, M.D., who has served as Chairman of the Council for the past nine years, was elected President of the Minnesota State Medical Association at the closing session of the House of Delegates. Doctor Oppegaard is affiliated with Crookston's Northwestern Clinic.

Other officers elected include:

L. E. Hammar, M.D., Mankato, First Vice President; E. W. Johnson, Jr., M.D., Rochester, Second Vice President; B. J. McGroarty, M.D., St. Paul, Secretary; Karl W. Anderson, M.D., Minneapolis, Treasurer; Donald McCarthy, M.D., Minneapolis, Chairman of the Council; H. M. Carryer, M.D., Rochester, Speaker of the House of Delegates; J. L. Falls, M.D., Red Wing, Vice Speaker; Alvin M. Jensen, M.D., Brownton, Councilor, Fourth District; George A. Sather, M.D., Fosston, Councilor, Eighth District; J. M. Stickney, M.D., Rochester, Delegate to the American Medical Association; A. O. Swenson, M.D., Duluth, Delegate to the American Medical Association; R. H. Wilson, M.D., Winona, Alternate Delegate; and Clarence Jacobson, M.D., Chisholm, Alternate Delegate.

Nineteen Honored for Fifty Years of Service

Nineteen Minnesota physicians who have completed fifty years of medical practice in Minnesota received special citations and awards at the annual banquet on Tuesday, May 24. Guest speaker for the banquet was Dr. Laurence M. Gould, President of Carleton College in Northfield. "Education for a World of Change" was the title of his address.

Also presented at the banquet was the Southern Minnesota Medical Association Medal given annually to an individual physician for preparation of the most outstanding scientific exhibit at the Meeting. The recipient of this year's award was Dr. Bror S. Troedsson of the Veterans Administration Hospital in Minneapolis. Doctor Troedsson's exhibit depicted Oscillometric Arterial Circulatory Norms. In addition, the Distinguished Service Award for outstanding contribution to the work of the Minnesota State Medical Association during the past year was awarded to Dr. William H. Hengstler of St. Paul. Doctor Hengstler has served as chairman of the Medical Advisory Committee of the Minnesota State Medical Association since 1940.

Physicians who received the Fifty-year Service Citation in 1960 include the following: Frank T. Cavanor, M.D., Minneapolis; Andrew Christiansen, M.D., St. Paul; Wallace H. Cole, M.D., St. Paul; James A. Johnson, M.D., Minneapolis; Herman Kesting, M.D., St. Paul; Charles Koenigsberger, M.D., Mankato; Martin L. Larson, M.D., St. Paul; Henry Lysne, M.D., Minneapolis; Axel S. N. Noran, M.D., Minneapolis; Justus Ohage, M.D., St. Paul; Leon J. Petit, M.D., Minneapolis; Monte C. Piper, M.D., La Canada, California; Irving A. Preine, M.D., Osseo; Nels O. Sandven, M.D., Paynesville; Theodore Satersmoen, M.D., Pelican Rapids; Max Seham, M.D., Minneapolis; Jalmar H. Simons, M.D., Aspen, Colorado; Fred C. Westerman, M.D., Montgomery; and Otto W. Yoerg, M.D., Minneapolis.

Receive AMA Certificates

Four Minnesota county medical societies received certificates from the American Medical Association for achieving 100 per cent or more of their goal in the 1959 AMEF campaign. The county medical societies named to receive awards were Wabasha, West Central, Goodhue and McLeod. Presentations were made by the Council.

American Medical Association

Report on Actions of the House of Delegates

Health care for the aged, pharmaceutical issues, occupational health programs, relations with allied health groups and relations with the National Foundation were among the major subjects involved in policy actions by the House of Delegates at the American Medical Association's 109th Annual Meeting held June 13-17 in Miami Beach, Florida. Total registration was approximately 20,000 including nearly 9,000 physicians.

A résumé of actions taken by the American Medical Association House of Delegates is as follows:

Health Care for the Aged

After considering a variety of reports, resolutions and comments on the subject of health care for the aged, the House of Delegates adopted the following statement as official policy of the American Medical Association:

"Personal medical care is primarily the responsibility of the individual. When he is unable to provide this care for himself, the responsibility should properly pass to his family, the community, the county, the state, and only when all these fail, to the federal government, and then only in conjunction with the other levels of government, in the above order. The determination of medical need should be made by a physician and the determination of eligibility should be made at the local level with local administration and control. The principle of freedom of choice should be preserved. The use of tax funds under the above conditions to pay for such care, whether through the purchase of health insurance or by direct payment, provided local option is assured, is inherent in this concept and is not inconsistent with previous actions of the House of Delegates of the American Medical Association."

The House also urged the Board of Trustees "to initiate a non-partisan open assembly to which all interested representative groups are invited for the purpose of developing the specifics of a sound approach to the health service and facilities needed by the aged, and that thereafter the American Medical Association present its findings and positive principles to the people."

In connection with an educational program regarding the aged, the House declared that "the American Medical Association increase its educational program regarding employment of those over sixty-five, emphasizing voluntary, gradual and individualized retirement, thereby giving these individuals not only the right to work but the right to live in a free society with dignity and pride."

Earlier, at the opening session, Dr. Louis M. Orr, retiring AMA president, had asked the House to go on record favoring more jobs for the aged, voluntary retirement and a campaign against discrimination because of age, whether it be forty or sixty-five. The House also gave wholehearted approval to Doctor Askey's urging that state medical societies take an active part in state conferences and other planning activities preceding the January, 1961, White House Conference on Aging.

Pharmaceutical Issues

In the pharmaceutical area, the House took two actions—one regarding mail order drug houses and the other involving the development and marketing of pharmaceutical products.

The House agreed with representatives of the pharmacy profession that the unorthodox practice of mail order filling of prescription drugs is not in the best interest of the patient. The statement pointed out that in this process the direct personal relationship, which exists between the patient-physician-pharmacist at the community level and which is essential to the public health and the welfare of patients, is lost.

The House also directed the Board of Trustees to request the Council on Drugs and other appropriate Association councils and committees "to study the pharmaceutical field in its relationship to medicine and the public, to correlate available material, and after consultation with the several branches of clinical medicine, clinical research, and medical education and other interested groups or agencies, submit an objective appraisal to the House of Delegates in June, 1961." The statement pointed out that certain proposals have been made which, if carried out, might impair the future of pharmaceutical research and development, thus retarding the progress of scientific therapy. It also said that the services of the pharmaceutical industry are so vital to the public and to the medical profession that an objective study should be made.

Occupational Health Programs

The House approved a revised statement on the "Scope, Objectives and Functions of Occupational Health Programs," which was originally adopted in June, 1957. The new statement contains no fundamental alterations in AMA policy or ethical relationships, but it adds important new material on the following points:

1. Greater emphasis on the preventative and

health maintenance concepts of occupational health programs.

2. A more positive statement of organized medicine's obligation to provide leadership in improving occupational health services by part-time physicians in small industry.

3. Increased emphasis on rehabilitation of the occupationally ill and injured.

4. Inclusion of the proper use of immunization procedures for employes, as approved by the House in 1959.

5. A more adequate statement on the need for teamwork with lay industrial hygienists in tailoring each occupational health program to the particular employe group involved.

In approving the revised guides for occupational health programs, the House also accepted a suggestion that the AMA Council on Occupational Health undertake a project to study and encourage the employment of the physically handicapped.

Allied Health Groups

The House approved the final report of the Committee to Study the Relationships of Medicine with Allied Health Professions and Services and commended it as "a monumental work." The report covers the present situation, future implications and recommendations, including guiding principles and approaches to activate physician leadership. The House strongly recommended that AMA activity in this vitally important area be continued and it approved the appointment of a Board of Trustees committee to carry on the work.

To develop physician leadership in promoting cooperative efforts with Allied health professions and services, the report suggested the following AMA activities:

1. A general conference should be held with allied scientists in the basic medical sciences and related disciplines for discussion of matters of common concern related to the creation of permanent, cooperative activities.

2. Specific exploratory conferences should be held with members of segments of science allied to a given area of medical practice with the national medical organizations concerned.

3. General and specific conferences should be held with professional and technical assistants on education, recruitment and coordination of contributions.

4. Through meetings and publications, reciprocal exchange of information should be provided between physicians and allied scientists and members of health professions.

5. Effective, continuing liaison should be established between AMA representatives and professional and technical personnel.

National Foundation

The House took two actions involving relations between the medical profession and the National Foundation. It adopted a statement of policies for the guidance of state medical associations and recommended that they be adopted by all component medical societies. These policies cover such subjects as membership of medical advisory committees at the chapter level, the function of these committees, and basic principles concerning financial assistance for medical care, payment for physicians' services and physicians' responsibilities for constructive leadership in medical advisory activities.

In another action, the House directed the Board of Trustees to authorize further conferences with leaders in the National Foundation on the problem of poliomyelitis as it relates to the betterment of the public health and to consider further joint action toward the eradication of polio. The House commended the National Foundation for its outstanding service in the attack against polio, but pointed out that much work remains to be done in public education, vaccination, continuing assistance for polio victims and continued research.

Miscellaneous Actions

The House also:

Strongly reaffirmed its support of the *Blue Shield concept* in voluntary health insurance and approved specific recommendations concerning AMA-Blue Shield relationships;

Approved a contingent appointment of not more than six months for *foreign medical school graduates* who have been accepted for the September, 1960 qualification examination;

Agreed that the American Medical Association should sponsor a *second National Congress on prepaid health insurance;*

Approved a Board of Trustees request to the Postmaster General for a stamp commemorating the *Mayo Brothers;*

Decided that the establishment of a home for *aged and retired physicians* is not warranted at this time;

Approved the establishment of a new *"Scientific Achievement Award"* to be given to a non-physician on special occasions for outstanding work;

Approved the following schedule for future *annual meetings:* Atlantic City, 1963; San Francisco, 1964, and New York City, 1965;

Approved the objectives of the AMA *Commission on the Cost of Medical Care* established by the Board of Trustees and headed by Dr. Louis M. Orr, immediate past president of the Association;

Urged individual members of the Association to take a greater interest and more active part in *public affairs* on all levels;

Reaffirmed its opposition to compulsory inclusion of physicians under Title II of the *Social Security Act* and recommended immediate action by all AMA members who agree with that position;

(Continued on Page 504)

Medical Education

MINNESOTA MEDICAL FOUNDATION

The Minnesota Medical Foundation, a non-profit organization of physicians, alumni and citizens supporting the University of Minnesota Medical School, has announced adoption of an expanded support program for the 1960-61 school year.

Its board of trustees is completing plans to raise $62,500 from members and private donors which would make possible:

—Up to forty scholarship awards of $500 each to deserving medical students.

—A distinguished service professorship to be awarded to a selected member of the medical school faculty.

—Expansion of the medical bulletin, official journal of the medical school, with revised format.

—Awarding of research stipends to medical students during vacations and periods of elective medical education.

—Establishment of a special basic research fund to support the work and ideas of young investigators at the medical school.

Dr. Herman E. Drill of Hopkins, president of the foundation, said enactment of the total program would depend on availability of funds, but that the 1,600 member organization had rededicated its present resources and energies to the long-term assistance of the University medical school at the University.

He named Alan W. Giles, Minneapolis life insurance executive, as chairman of the foundation's fund raising committee. Other committee heads are Dr. H. Mead Cavert, scholarships awards; Dr. Wesley W. Spink, editorial; Dr. E. B. Brown, Jr., membership; Dr. R. S. Ylvisaker, liaison; Dr. John A. Anderson, research awards; and Malcolm B. McDonald, finance.

"Our program," said Dr. Drill, "is designed to help the medical school maintain its high standards in the training of tomorrow's physicians. Only a portion of this increasingly costly process can be met by legislative appropriation. To fill the gap, the nation's eighty-five medical schools have already come to rely heavily on voluntary gifts from alumni, citizens, industry and foundations."

He said the Minnesota Medical Foundation's new program has emerged from recommendations of a 1958 faculty committee which surveyed the present and future needs of the University of Minnesota medical school. The committee was headed by Dr. Arnold Lazarow, head of the anatomy department and vice president of the foundation.

The foundation recently received a $2,000 grant from the Minnesota State Medical Association with which to launch and administer a special emergency loan fund for medical students.

AMA HOUSE OF DELEGATES

(Continued from Page 503)

Called for a review of existing and proposed legislation pertaining to *food and color additives,* with the objective of supporting appropriate measures which are in the public interest;

Urged reform of the *federal tax structure* so as to return to the states and their political subdivisions, their traditional revenue sources;

Asked state and county medical societies to make greater use of AMA *recruitment materials* in presenting medicine's story to high schools;

Requested the Board of Trustees to initiate a study of present policy regarding the required content and method of preparing *hospital records;*

Directed the Board of Trustees to develop *group annuity* and *group disability* insurance programs for Association members; and

Expressed grave concern over the indiscriminate use of *contact lenses.*

Election of Officers

Dr. Leonard W. Larson of Bismarck, North Dakota, former chairman of the AMA Board of Trustees and of the AMA Commission on Medical Care Plans, was named president-elect by unanimous vote. Doctor Larson will succeed Dr. E. Vincent Askey of Los Angeles as president at the Association's annual meeting in June, 1961.

The AMA 1960 Distinguished Service Award, one of medicine's highest honors, was given to Dr. Charles A. Doan, who will retire next year as dean of the Ohio State University College of Medicine and director of the Health Center in Columbus, Ohio. In addition to Dr. Leonard Larson, new president-elect, the following officers were named: Dr. William F. Costello of Dover, N. J., vice president; Dr. Norman A. Welch of Boston, re-elected speaker of the House; Dr. Milford O. Rouse, Dallas, Texas, re-elected vice speaker.

Dr. Gerald D. Dorman of New York City was elected to the Board of Trustees to succeed Doctor Larson, and Dr. James Z. Appel of Lancaster, Pa., was re-elected to the Board.

Elected to the Judicial Council, to succeed Dr. Louis A. Buie of Rochester, Minnesota, was Dr. James H. Berge of Seattle.

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

FRENCH DOCTORS "STRIKE" AGAINST GOVERNMENT MEDICINE

French physicians and dentists recently initiated a strike aimed at the government rather than the patients. According to one report, the government was seeking to limit the fees charged to Frenchmen eligible to receive state aid. According to the new schedule, physicians would receive $2.00 per office call in Paris. The current fee in Paris is $3.00 to $4.00. The fees are usually lower in the provinces.

The medical show of protest was in the form of a twenty-four-hour strike. During this time physicians in Versailles and other Paris suburbs refused to handle anything but emergencies.

In other sections of France, doctors launched a "paper strike" refusing to sign certificates required by patients in order to recover medical costs from the government. In many instances, physicians complicated government claim processing procedures by substituting personal stationery receipts.

Workmen's compensation claims were often marked "permanent incapacity possible," with the result that lengthy judicial inquiries were found necessary in many cases.

MEDICARE HEAD SAYS FEE RAISES ARE INFLATIONARY

Physicians should be satisfied with their Medicare fee schedules "for some time to come," according to Brigadier General Floyd L. Wergeland, Executive Director of Medicare. "We believe we are paying physicians' fees that probably approach the upper limits of fairness," the Medicare head told a recent meeting of the Dependents' Medical Care Advisory Committee. "It is not sound policy for us to accept inflation as a justification for increasing the fee schedules."

NECESSITY OF VOLUNTARY HEALTH CARE FOR THE AGED EMPHASIZED

Dr. F. J. L. Blasingame, Executive Vice President of the American Medical Association, in a recent address to the Annual Meeting of the Health Insurance Association of America in Dallas, Texas, said "it would be a tragic error to abandon voluntary health care financing for any segment of the population—young or old."

He said the "phenomenal progress" of voluntary health insurance paralleled advancements in medical care itself and that only this kind of competitive, private enterprise was capable of developing the best coverage for the American people.

"I am afraid that the starry-eyed benevolence purveyors who support Forand-type legislation are working under a delusion. They seem to think that good health for all the aged will arrive the moment a law of compulsion is passed."

"It was unbelievable," he added, "to watch these Pied Pipers operate and to see years of work and study on voluntary health insurance for the aged trampled under foot by self-styled experts."

Crash Program Necessary?

Arthur M. Browning, Chairman of the Health Insurance Council and Vice President in Charge of Group Insurance, New York Life Insurance Company, told the gathering of executives from 270 insurance companies that "a crash program to end all crash programs may prove to be the only way to defeat the forces of collectivism."

Mr. Browning said if some type of federal plan for medical care for the aged is enacted this year, it would hasten the nationalization of medicine and insurance. If no such legislation is enacted this year, he said, "the race between voluntary plans and some federal plan for the aged during the next two years will make the four-minute mile appear to be a leisurely stroll." He added:

"The job of covering the remaining aged which otherwise might proceed over a period of years, may have to be done almost instantaneously."

Substantial Progress Reported

Mr. Browning reported that the "substantial progress" already made toward solving problems among insurers, physicians, and hospitals "can be the basis for confidence in our ability to solve current and future problems."

Among areas of recent progress he listed: simplification of claim forms; development of more efficient methods for insured individuals to enter

hospitals without the necessity of cash down payments; development of "meaningful and reliable" data and statistics on health coverage; opening of wide, new channels of communication among the three professions; and common efforts toward stabilizing health care costs.

MEDICAL CARE PAYMENTS FOR NEEDY RISE SHARPLY

Medical payments for the indigent under four Federal-state programs have risen more than 100 per cent in a five-year period. This finding is based on a new health insurance institute study, with figures supplied by the Social Security Administration. In 1953, medical-care vendor payments for the aged, dependent children, the blind, and persons receiving disability payments totaled $106 million; in 1958, it came to $265 million. Total payments for all four programs in 1958—food, clothing and housing, as well as medical aid—were $2.9 billion, of which the Federal government contributed 60 per cent.

Another survey indicates that an annual total, well in excess of $400 million, is in prospect. In March, 1960, payments for that month were $24,769,124 for persons on old age assistance; $5,023,068 for dependent children; $680,278 for the blind, and $4,112,308 for the permanently and totally disabled. The aggregate, about $35 million, is at an annual rate of $420 million.

Tax Exemption Advice Given

Hospitals, nursing homes, foundations, and other institutions applying for tax exemption are requested by the Internal Revenue Service to list full and complete names and addresses of all donee organizations.

Processing of a great many applications are delayed because applicants fail to provide correct corporate or legal names of recipients of their benefactions.

Bureau of Labor statistics show that "medical care" for the month of April rose 0.3 per cent over the March figure. By comparison, the Index was 155.5 or 55.5 per cent higher than the 1947-49 average.

The following statistics were revealed in the quarterly breakdown of medical care. The highest item—hospital rates—had an index of 220.6. Physicians' fees, considered apart from all other items, stood at 144.1, well above surgeons' fees, 128.8. For dentists' fees, the index was 136.8. Least expensive components of medical care, based on 1947-49 average=100, were prescriptions and over-counter drugs. Their composite index was 123.0.

NEW TAX RULING GIVEN ON MEDICAL COSTS FOR DEPENDENT PARENTS

The tax law has been changed by Congress so that a taxpayer may now deduct the full amount of any medical or dental expenses which he pays on behalf of his or his spouse's dependent parents, provided they are at least sixty-five years of age before the end of the taxable year. This marks a change from the previous law which allowed deductions not exceeding 3 per cent of the taxpayer's adjusted gross income.

WORTH WATCHING . . .

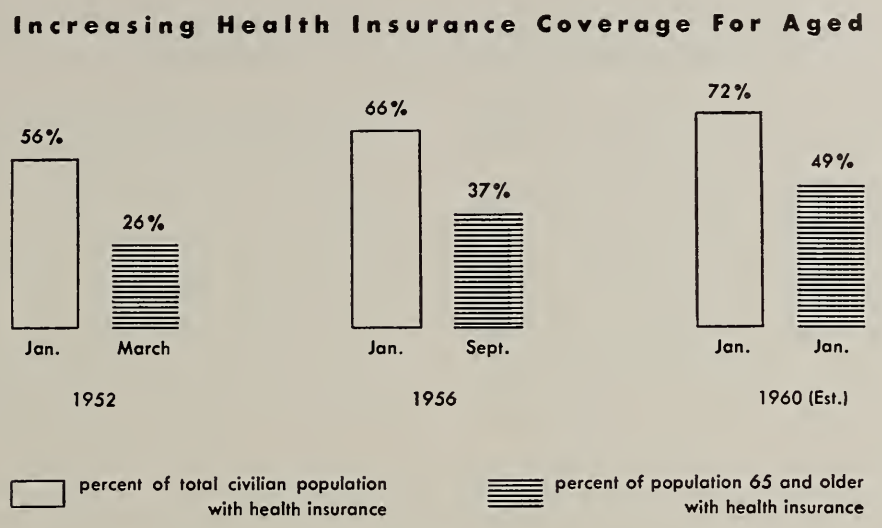
- Congress may attempt to tack an amendment to pensions for self-employed persons legislation placing doctors under the social security system.
- The New York Legislature recently killed a bill which would have licensed chiropractors in that state.
- Congress has been asked by U. S. Comptroller General Joseph Campbell to pass a law which would enable the government to recover millions of dollars which are currently spent each year for hospital and medical care in negligent third-party cases. Senator Harry F. Byrd, of Virginia, has stated that he will sponsor and press for the enactment of legislation which would correct this situation. Senator Byrd is Chairman of the Joint Committee on Reduction on Nonessential Federal Expenditures.

Many of the abuses have come from the military personnel. It has been pointed out that each year Uncle Sam spends in the neighborhood of $10.5 million to care for military personnel in hospitals and otherwise provide medical service as the result of private automobile accidents. Presently, the Department of Defense has no legal authority to recover losses from a negligent third party or from proceeds paid by a third party to the patient.

Presently, the Federal Employes' Compensation Act enables U. S. to recover certain costs of medical and hospital care rendered to civilian Federal workers. To a limited degree, the Veterans Administration has been getting some reimbursment in

comparable cases, but under a general provision of the law rather than specific authorization, which the Comptroller General and Senator Byrd are now recommending.

Association said, another 15 per cent, or 2.4 million persons, are officially classified as indigent, and provision is made for their medical needs through Old Age Assistance, supported by Federal-state



HALF OF AGED HAVE HEALTH COVERAGE

Forty-nine per cent of all Americans sixty-five years of age or older had health insurance protection against the costs of ill health at the beginning of 1960, according to the Health Insurance Association of America.

Of the 15.7 million persons in this age group, an estimated 7.7 million had health insurance, said the Association in issuing the first analysis made on a nationwide basis since early 1958 of the extent of health insurance coverage among "senior citizens." The report was based on coverage trends revealed in government and private surveys taken during the last decade and on developments in the health insurance business.

Because of accelerated activity by insuring organizations in this area, the growth of health insurance protection among persons sixty-five and older during the past eight years has been at a more rapid pace than for the population as a whole, according to the Association, which is composed of 270 insurance companies.

In early 1952, one out of every four senior citizens had health insurance, and now one out of two are so protected. Over the same period, the growth in coverage for the total population was from nearly six out of every ten persons to a little more than seven out of ten.

In addition to the 49 per cent of the sixty-five-and-over who now have health insurance, the matching fund programs. Such persons also receive money for food, housing, clothing, and other needs.

Government Surveys

According to the U. S. Department of Health, Education, and Welfare, 26 per cent of senior citizens had health insurance in March 1952, and by September 1956, this figure has grown to 37 per cent.

The most recent survey in this field was made in Spring 1958 by the National Opinion Research Center of the University of Chicago, which found that 43 per cent of senior citizens had health insurance. The rate of growth from 1952 to 1958 averaged out to a little less than 3 per cent a year, reported the Association.

The introduction of new insuring techniques has marked the increased activity in the sixty-five-and-over field by insuring organizations, according to Association spokesmen. One technique has been the mass-enrollment approach of issuing health insurance to large groups of aged persons in a state.

Many of the estimated fifty-one million persons now covered by group insurance policies issued by insurance companies will be able to continue their insurance after retirement, generally with part or all of the premium paid by the employer. Other workers will be able to convert their group insurance to individual policies.

Public Health

EXTENSION OF HOME NURSING CARE SERVICES TO THE ILL AND DISABLED IN RURAL MINNESOTA

In Minnesota, there were an estimated 335,000 persons over sixty-five on July 1, 1958. The following May 15 there were 14,583 licensed nursing home beds. With but four and one-third beds per thousand persons over sixty-five, many of whom suffer from a chronic disease or disability, it follows that most of those over sixty-five reside in private homes. Undoubtedly, when needed, home care is best and is the only practical solution when such large numbers are involved. Home nursing care, with other community services, can do much to improve the welfare of these oldsters.

To provide additional nursing service, several counties maintain rosters of registered nurses and licensed practical nurses who are willing to give home nursing care services in their communities on a fee basis. The public health nursing agency can refer the family to nurses who are available for home nursing care. There is no statistical information available on the use of this service or fees collected because, after the initial referral, the matter of services and fees therefore concerns only the patient, the nurse, and the physician in charge of the case, and no agency records are kept. Development and use of such rosters and referral system should be encouraged, especially in areas with low population density where travel would be excessive, were a single county nurse to provide this service.

Among the seventy-three counties in Minnesota with organized public health nursing services, fifty-three counties have only one public health nursing position, fourteen counties have two positions, one county has three positions, three counties have five to eight positions, and two counties have ten to fourteen positions. Most public health nurses serve from 15,000 to 30,000 people. A long established ratio is one public health nurse per 5,000 population. Without some plan to provide additional nursing staff, it appears unlikely that home nursing care services can be increased to any appreciable extent.

In 1955, the Legislature authorized county public health nursing services to employ licensed practical nurses and registered nurses to provide home care services on a fee basis. In 1959, as a result of a Legislative act, the Minnesota Department of Public Welfare instituted a homemaker service with a view to keeping the family intact and avoiding the cost for institutional care. While several counties have authorized a fee for home nursing service under the 1955 statutes, the Rural Hennepin County Nursing Service and Steele County are the only agencies operating such a service. In 1958, the Department conducted a pilot study in Steele County which involved the employment of a licensed practical nurse to assist the county public health nurse to better meet the home nursing care needs of residents in the county. This project showed the values in terms of money and service of such a plan.

In order to give impetus to the extension of home nursing care services it is proposed that funds be made available, within budget limitations, to provide eligible counties a grant-in-aid which they would use to employ a registered or licensed

NURSING SERVICE IN MINNESOTA
(Exclusive of Minneapolis, St. Paul and Duluth)

Year	Total Patient Visits	Total Therapeutic Nursing Visits	Per Cent of Therapeutic Visits to Total Visits	Total Adult Health Visits*	Total Adult Therapeutic Visits	Per Cent of Therapeutic Visits to Adults
1957	167,148	23,486	14.05	41,341	15,970	39
1958	156,982	22,003	14.01	42,600	15,631	37
1959	130,819	22,771	17.4	41,062	19,558	48

*Excludes all tuberculosis, communicable disease, maternity and children.

RURAL HENNEPIN COUNTY NURSING SERVICE

Year	Therapeutic Home Visits for Adult Health	Per Cent of Total Home Visits	Fees Received	Average Fee Received Per Visit
1958	4,231	40	$1,946.75	$.46
1959	5,192	43	2,970.90	.57

practical nurse to establish or extend home nursing care services—$1,500 would be granted for the first twelve months, $1,000 for the second twelve months, $500 for the third twelve months, and nothing thereafter. It is believed that assistance for three years should demonstrate sufficient values of such a service so that participating counties would be willing to carry on at their own expense, or that such grants might, to meet a demonstrated need, be continued with funds requested from and appropriated by the Legislature. Grants-in-aid would be contingent upon the county adopting a fee system on a sliding scale in accordance with the 1955 statutes (Section 145.123). It is estimated that $10,000 might be used the first year. Subsequent amounts would depend upon development of such services.

In Minnesota, exclusive of Minneapolis, St. Paul and Duluth in 1959, nursing visits for home care have increased as shown in the accompanying table.

FOOD SERVICE AND LODGING CONTROL

The State Board of Health has long been aware of deficiencies in its program of lodging and food service control. These deficiencies are inadequate staff, to make the necessary inspections and carry on educational work, and the present antiquated laws. For many years following the establishment of the program in a separate department in 1903 and following its transfer to the Health Department in 1925, the principal concern was in the area of lodging. In the past twenty or more years, greater emphasis has been placed on sanitation of food service. The justification for this emphasis lies in the fact that food is by far the leading source of intestinal illness. Although such illnesses are poorly reported, national figures show that food causes about thirty times as many outbreaks as water and twenty times as many as milk.

At the request of the Department, the Public Health Service in 1952 made a study of the existing program. The report pointed out several defects, most of which have been corrected, but the principal emphasis was on the need for increased personnel and clarified legislation. In order to secure the support of the food service and lodging industry, the Department outlined a proposed program of expansion, which would involve considerable increase in license fees, and presented it to the various associations representing the industry.

After agreement was reached, a bill was introduced in 1955 too late for consideration. In 1957, the bill became involved in a discussion of whether this program should not be in the Department of Agriculture. In 1959, considerable progress was made but objection was raised to the length of the bill and the size of fees. It is proposed to introduce another bill in 1961 with the specific sanitation requirements removed for adoption as regulations by the Board. Another objection was to the proposal for dedication of license fees to finance the program. The legislature opposes this principle on which the industry insists if the fees are to be raised from those that have been in effect since 1905.

In developing this proposed legislation, the Department has made every effort to eliminate duplication with other State departments and local agencies, and has endeavored to delegate inspections to qualified local health departments where possible.

Persons who advocate transfer of this activity to the Department of Agriculture allege that since that department regulates production, processing and manufacture of food products, it should also regulate the places where food is served. Of the several areas of food control, i.e., production, "food and drug" activity, wholesale and retail, and food service, the latter is the one in which the food is most susceptible to changes that affect health and the one in which educational endeavors are the most effective. The Health Department program makes an effort to develop an awareness of the need for hygienic food service rather than employing the enforcement measures that are effective in other areas.

Authority for food service control is vested solely in the health department in thirty-eight states and jointly in the health department and another agency in four others. In only six states is this program participated in by the department of agriculture. Nationally the Public Health Service is responsible for food service control on interstate carriers and for development of advisory codes for use by states and other governmental subdivisions. The Federal Food and Drug Administration is in the Department of Health, Education and Welfare. The Commission on Organization of the Executive Branch of the Government (Hoover Commission), in January 1949, went so far as to recommend transfer to the Food and Drug Administration and the Public Health Service many of the functions traditionally centered in the Federal Department of Agriculture because of their relation to public health.

Tumor Clinic

Every Four Years An Outstanding Opportunity To Come Up-To-Date On Cancer

This year . . . 1960 . . . Minnesota doctors can attend this international symposium in Minneapolis . . . when the University of Minnesota hosts the Fourth National Cancer Conference on its campus, September 13, 14 and 15.

Sponsored by the American Cancer Society and the National Cancer Institute, the Conference will bring clinicians, research workers and cancer specialists from around the world to the Twin Cities. Invitations have been sent to all physicians in the United States. Attendance is expected to approach 3,500.

Typical of the cancer specialists who will attend the meeting are:

ERIC BOYLAND, Ph.D., D.Sc.

London, England

Dr. Boyland is a professor of biochemistry at the University of London and was recipient of the Judd Award for Cancer Research in New York in 1948. He will participate in a special evening session on Wednesday, September 14, on "Cancer in the World Around Us." Dr. Boyland will present a paper on *Food Additives and Contaminants.*

NIKOLAI BLOKHIN, Ph.D.

Moscow, USSR

Dr. Blokhin heads the Institute of Experimental and Clinical Oncology of the USSR Academy of Medicine in Moscow. He will participate in a session on "Cancer of the Male Genitourinary Tract" on the second day of the conference.

SIDNEY FARBER, M.D.

Boston, Massachusetts

As a professor of pathology at Harvard Medical School's Children's Hospital, Dr. Farber is pathologist-in-chief and chairman of the Division of Laboratories and Research at Children's Medical Center. He is founder and scientific director of the Children's Cancer Research Foundation. With his interest in tumors and pathology in infancy and childhood, he received the annual National Divisional Award of the American Cancer Society for Massachusetts in 1958. He will chair a session on Leukemias and Lymphomas on Wednesday.

Southern Minnesota Medical Association

To Meet September 12

The annual meeting of the Southern Minnesota Medical Association, scheduled September 12 in Mankato, will provide Category I credit for members of the Minnesota Academy of General Practice.

During the morning and afternoon sessions of the meeting, a total of twenty papers of general interest to general practitioners will be presented. From noon until 2 p.m., the annual business meeting of the Association will be held during a complimentary luncheon.

Concluding the day-long meeting will be the evening program, featuring Dr. Ed Litin of the Mayo Clinic.

Papers to be given in the morning will be:

"A Five Year Review of Erythroblastosis Foetalis in a Small Community," by Dr. John T. Olive and Dr. Donald B. Swenson, Mankato.

"The Management of Sinusitis" by Dr. C. F. Lake, Mayo Clinic.

"Pediatric Eye Problems" by Dr. Malcolm A. McCannel, Minneapolis.

"Is There a Steroid of Choice in the Treatment of Rheumatoid Arthritis" by Dr. Emerson Ward, Mayo Clinic.

"Periodic Familial Paralysis" (case report) by Dr. John E. Verby of the Olmstead Medical Group, Rochester.

A paper on mononeuropathies by Dr. Donald Mulder, Mayo Clinic.

A case report involving the differential diagnosis between strokes and brain tumor by Dr. H. J. Svien, Mayo Clinic.

"The Neuro-Ophthalmological Evaluation of Patients with Stroke" by Dr. Robert W. Hollenhorst, Mayo Clinic.

A paper concerning surgical management of strokes by Dr. F. Henry Ellis, Jr., and Dr. P. E. Bernatz, Mayo Clinic.

A case report entitled "Hemiplegia in Early Pregnancy" by Dr. William S. Chalgren, Mankato.

During the afternoon session, the following papers will be presented:

"The Surgical Management of Chronic Bullous Emphysema" by Dr. W. Robert Schmidt, Minneapolis.

"Current Concepts of Treatment of Severe Bronchial Asthma" by Dr. William Sawyer Eisenstadt, Minneapolis.

"Some Complications of Myocardial Infarction" by Dr. Reuben Berman, Minneapolis.

"Congenital Upper Urinary Tract Lesions in Adults" (case report) by Dr. David P. Anderson, Austin.

"Urinary Infections in Adults" by Dr. Richard S. Rodgers and Dr. Bruce E. Linderholm, Minneapolis.

"Chronic Recurrent Urinary Tract Infections Children" by Dr. Arnold S. Anderson, Minneapolis.

"Recent Development in the Treatment of Obesity" by Dr. Lewis W. Younger, Winona.

"The Review of Orf" by Dr. John L. Farmer, Jr., Rochester.

"Surgical Treatment of Superficial Phlebitis of the Lower Extremity" by Dr. Thomas T. Myers, Rochester.

"Unusual Manifestations of Ophthalmopathy Associated with Graves' Disease" by Dr. D. A. Scholz, Dr. S. F. Haines and Dr. John W. Henderson, Rochester.

Minnesota Blue Shield

The phenomenal growth of Blue Shield medical care plans and their contribution to the economics and sociology of medical practice today may often be taken for granted by both the public and the medical profession, unless a simple restatement of accomplishments is made from time to time.

First, Blue Shield represents the most significant single development in medical economics ever voluntarily undertaken and successfully executed by the medical profession. More than that, the medical profession deserves much credit for having proven voluntary pre-payment plans are possible on a community-wide basis, and for paving the way for the commercial insurance industry to devise plans of their own in a field they had avoided previously.

In twenty years, the number of individuals covered by Blue Shield has grown from none to over 42 million. Throughout the United States during 1959, Blue Shield plans paid a total of $610,342,-407 in surgical-medical care expenses.

Included in this total is the $10,197,592.98 paid by Minnesota Blue Shield for surgical-medical care of its subscribers. This set a new annual record for Minnesota Blue Shield and brought the total paid since the Minnesota plan was organized in 1947 to nearly $61 million.

These impressive sums constitute a most important segment of the nation's medical economy and are evidence of the soundness and vitality of the Blue Shield idea which was undertaken with such a mixture of hope and doubt in 1939.

An important key to the success of Blue Shield has been its expansion of services covered, and the addition of new, bold programs such as Minnesota Blue Shield's Senior Citizens Plan, which met with such success in its May-June 1960, enrollment period.

Minnesota Blue Shield's recent addition of a diagnostic benefit likewise is in the tradition of broad coverage for as many services as possible throughout the community.

The constant search for new solutions to medical coverage problems has been the hallmark of Blue Shield during its first twenty years and promises a future of service to the doctor and the patient even more dramatic than its past.

That future, however, will not be without constant challenges from politicians and pressure groups, who will be quick to observe whether or not the Blue Shield plans and other voluntary pro-programs are "adequately" serving the country's needs. Blue Shield, at least, has proven it can serve those needs to the best interest of the public and the medical profession.

* * *

In one of the most significant actions affecting Minnesota Blue Shield taken by the Minnesota State Medical association at its annual convention in Rochester in May, the association authorized Blue Shield to negotiate with labor and management in developing contracts for employees.

This unprecedented action was taken by the House of Delegates of the State Medical Association following a request made by the Range Medical Society, which includes the northern part of St. Louis, Itasca and Koochiching counties, areas with a high concentration of miners and steelworkers.

The Range Society noted that these areas are frequently confronted with requests for negotiations with labor which require immediate action in medical care plans.

Such contracts would vary from standard Blue Shield programs in that they would involve higher ceiling limits on income and payments to doctors.

Authority was requested, therefore, to enter these emergency negotiations with labor and management to devise workable contracts for a given area.

Following successful results in the Range Medical Society's area, the authority may be extended to other parts of the state, it was said.

In granting the authority, the House of Delegates stipulated that Blue Shield could negotiate with labor and management only if the final contract, in all its terms, was approved by the local medical society and the Council of the State Medical Association.

Dr. Clarence Jacobsen, Chisholm, president of the Minnesota State Medical Association, said the development would provide patients with a wider freedom of choice of doctors.

The move was also approved by Dr. Robert P. Buckley, Duluth, councilor for the Ninth District.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

THIRTY-FIVE DEATH WARRANTS FOR AN ASSOCIATION

The life of an Association is dependent upon its individual members. The number of associations, professional societies, and community service organizations which seek to also include the names of physicians on their membership rosters are almost innumerable. Certain responsibilities as well as privileges accompany the possession of a membership card for most associations.

Before joining an organization, the prospective member would do well to evaluate the future demands upon time, talent, and the extent of financial participation. To be active in a given organization or association will not infrequently require appointment to a committee which could require varying demands of time out of a daily work schedule.

Then, too, the possibility of becoming elected to an office with its accompanying responsibilities and duties must not be overlooked.

Failure to assume the obligations expected of an organization by its members may result in poor personal and public relations—internally and externally. Numerous are the laments of association or society officers who find that they have an impressively large roster with a "let Joe do it" philosophy.

Thirty-five rules to kill an association have been compiled by Vern Scofield of the Nebraska Press Association. To follow the rules cited by Mr. Scofield would, without doubt, produce the desired result.

Do you want to see your society or association live? The prescription is simple. *Don't* follow the following rules!

1. When you attend a meeting, vote to do something, then go home and do the opposite.
2. Don't come to the meeting.
3. But if you do come, come late.
4. If the weather doesn't suit you, don't think of coming.
5. If you do attend a meeting, find fault with the work of the officers and other members.
6. Never accept an office or committee appointment as it is easier to criticize than to do things.
7. Nevertheless, get sore if you are not appointed on some committee; but if you are, do not attend committee meetings.
8. If asked by the chairman to give your opinion regarding some important matter, tell him you have nothing to say. After the meeting tell everyone how things ought to be done.
9. Do nothing more than is absolutely necessary; but when other members roll up their sleeves and willingly and unselfishly use their ability to help matters along, howl that the Association is run by a clique.
10. Don't bother about helping get new members.
11. When a banquet is given, tell everybody money is being wasted on blowouts which make a big noise and accomplish nothing.
12. When no banquets are given, say the Association is dead and needs a can tied to it.
13. Don't ask for a banquet ticket until all are sold.
14. Then swear that you were cheated out of yours.
15. If you do get a ticket, don't pay for it.
16. If you are asked to sit at the speakers table, modestly refuse.

17. If you are not asked, resign from the Association.

18. Hold back your dues as long as possible, or don't pay at all.

19. If you don't receive a bill for your dues, don't pay.

20. When you do receive a bill for your dues postpone paying until the secretary writes for the money—then get sore because you were dunned.

21. If you receive a bill you've paid, resign from the Association or at least suggest to some of the members that Central Office tried to work you or is manipulating the accounts.

22. Don't tell the Association how it can help you, but if it doesn't help you, resign.

23. If you receive service without joining don't think of joining.

24. If the Association doesn't correct abuses in your neighbors business, howl that nothing is done.

25. If it calls attention to abuses in your own, resign from the Association.

26. Always think about and don't fail to talk about the "mote" in the other fellow's eye—never consider the "beam" in yours.

27. Keep your eyes open for something wrong and when you find it, resign, or at least raise plenty of dickens.

28. At every opportunity, threaten to resign and then get your friends to resign.

29. Agree to everything said at the meeting and disagree with it outside.

30. Always delay replying to communications from the Association, or better, don't answer at all.

31. When asked for information, don't give it, then

32. Criticize the Association for incompleteness of its information.

33. Get all the assistance the Association gives, but don't give it any.

34. Talk cooperation for the other fellow with you but never cooperate with him.

35. When everything else fails, blame the Secretary.

LEAFLET OUTLINES HEALTH INSURANCE USES, ABUSES

"Let's Use, Not Abuse, Health Insurance" is a new American Medical Association leaflet, based upon an AMA House of Delegates policy statement. It outlines the problem of health insurance abuse simply and strongly. It spells out some specific responsibilities that patients, hospital people, unions, employers, and doctors themselves share if we are to "hold the line" on these costs.

Here are some points emphasized in it:

- ★ Consider your health insurance an "investment." Know what it is, what it can and cannot do and how to use it properly.
- ★ Don't expect health insurance to pay every expense related to health maintenance.
- ★ Don't pressure your physician into hospitalizing you unnecessarily. Some procedures can be performed with equal safety and efficiency and greater economy in the physician's office.
- ★ Remember—you don't have to "collect" on your insurance to win. You win when you are spared the economic and related consequences of accident or illness against which your insurance protects you.

Though the American Medical Association has distributed copies of this new piece to key labor, hospital, insurance, farm and management groups as well as to the press, your help in circulating it to people in your area is needed. You may wish to obtain quantities for your own patients. Order copies from your state office.

History of Medicine in Minnesota



MEDICINE AND ITS PRACTITIONERS IN MOWER COUNTY PRIOR TO 1900

NORA H. GUTHREY
Stewartville, Minnesota

A well-known historian once said, in effect, that historians have learned that the most they can hope for is to establish facts beyond a reasonable doubt—that their raw materials are statements, and that statements must not be mistaken for facts. As the immortal Captain Bunsby remarked about a quite different matter, "The bearings of this observation lays in the application on it."

Now that more than a century of medical practice in Minnesota has elapsed, one who compiles a story of the practice and the practitioners of medicine in a county of the state prior to 1900 must consider himself not an author or a historian, but rather an editor, in the sense of selecting historical material.

This paragraph will serve in lieu of a detailed bibliography of the present notes on physicians of Mower County and their work. The writer has drawn much information from general histories of the county and the state, and for the purpose of verifying intercounty practice of medicine and the frequent changes in residence of the physicians, has referred to histories of medicine in other counties that have been published in MINNESOTA MEDICINE, beginning in 1938. In addition, numerous other sources have been helpful, among them official records and registers of various types relating to physicians; old issues of official medical journals since their beginning in the state; the *Transactions* of the Minnesota State Medical Society ("Association" from 1903); and old newspapers. Whenever possible, interviews with or communications from members of the families of the early physicians have been obtained.

About many of the numerous physicians who were in Mower County only a few months, a year, or perhaps a few years, there unfortunately has been little more available than note of name, place of practice, and probable duration of stay. There were, of course, various practitioners who were frankly itinerant, and there were quacks. The physicians who were best known are mentioned briefly in the

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Mrs. Guthrey is a retired member of the nonmedical staff of the Mayo Clinic; a former member of the Publications Department; secretary and assistant to the late Dr. William J. Mayo, 1919 to 1939, inclusive; later, on special assignment in editing and compiling, and in research and writing on regional medical history (Houston, Fillmore and Olmsted Counties).

Acknowledgments.—Great credit is due to Dr. Paul C. Leck, Austin, Minnesota, who some years ago, as historian of the Mower County Medical Society, began collecting data toward the early medical history of the county. Many excerpts from his material are incorporated, without special designation, in this article.

Dr. O. H. Hegge of Austin has been materially helpful in discussing the practice of medicine in the county in the later eighteen nineties, and particularly in commenting on the organization of St. Olaf Hospital and the formation of the Mower County Medical Society.

Dr. Robert Rosenthal, of St. Paul, Chairman of the Historical Committee of the Minnesota State Medical Association, generously has supplied official data relating to many of the early physicians of Mower County.

Thanks are expressed to those members of the families of early physicians who co-operated in the effort to prepare accurate biographical sketches.

text; notes about them and all others believed to have been of the regular school or of other schools of practice recognized in their day are included in the series of biographical sketches or comments that follows the narrative.

Chiefly General History

Something of the early history of the county is presented to give a conception of the scene in which the pioneer physicians followed their profession. Those who are interested in greater detail are referred to the general histories of Mower County of 1884 and 1911, both of which provide fascinating reading and a wealth of information about pioneer settlers, early events, and development.

One of the nine southernmost counties of the state, Mower County is the third west from the Mississippi River. It is bounded on the north by Olmsted and Dodge Counties, on the east by Fillmore County, on the south by Iowa (Mitchell and Howard Counties) and on the west by Freeborn County. When, by degrees, the original vast counties of Minnesota Territory were divided into smaller counties, the present limits of Mower County were defined, in February, 1855; and on March 1, 1856, the county was organized and named in honor of John E. Mower, an early settler. The twenty townships were created, in four tiers of five townships each. On a map they appear, reading from west to east, and from the northern tier to the southern: Udolpho, Waltham, Sargent, Pleasant Valley, Racine; Lansing, Red Rock, Dexter, Grand Meadow, Frankford; Austin, Windom, Marshall, Clayton, Bennington; Lyle, Nevada, Adams, Lodi, Le Roy. They were divided early into sections. In April, 1858, they were empowered to maintain local governments. As population increased, towns were founded: The city of Austin came into being early in 1856; on April 17 two plats of Austin were recorded by two groups of citizens, but the actual site described in both was the same. Frankford, Hamilton (on the line between Mower and Fillmore Counties), Le Roy and Brownsdale soon followed. The other villages were established between 1857 and 1871. Nevada, Troy City, Two Rivers and others were laid out early but were not settled.

The land is gently undulating prairie, well watered by three main rivers, the Cedar, the Iowa, and the Root, and by their numerous tributary creeks; drainage is to the south, southeast, and northeast. There are few lakes, none of any great size, and there is very little marshy land. In the main, the soil is a rich sandy loam, suitable for cultivation. In the early years there were sufficient trees along the watercourses to supply the pioneers with fuel, but not enough to furnish lumber in abundance for building. There was much good building stone, however, in different parts of the county. A topographical feature which was to have civic and political importance is a strip of prairie running north and south in the central portion, dividing the county into the east side and the west side. The eastern, western, and southern parts of the county in general were settled first and most thickly.

Because of its situation inland, the future Mower County probably was not visited by any of the early explorers who traveled the main waterways of the territory which was to become Minnesota. The earliest recorded visit of white men was in 1835, when a military expedition from Fort Des Moines passed through the region. In 1836, Major Lawrence Taliaferro with a hunting party of officers from Fort Snelling reached this part of the county and camped overnight by the Cedar River, somewhere near where Austin now stands. With the group was Dr. John Emerson, the surgeon at Fort Snelling, and therefore it may be said that the first physician (excluding the Indian medicine men) to enter Mower County was a military surgeon on a hunting trip, sixteen years before the first white settler arrived and nineteen years before the first physician settled here. No doubt the trip was successful, for wild game abounded, then, and twenty years later. In the winter of 1840-1841, it

is said, a party of 150 Indians and their families was induced by Henry Hastings Sibley (then agent for the American Fur Company at Mendota and later the first governor of Minnesota) to conduct a great hunt in this region. The Indians' headquarters were a large stockade, the first structure built here by white men, located beside the Cedar River, north of the site of Austin. The fur company furnished the Indians with guns and ammunition at a price. By spring, the Indians had "killed 2,000 deer, fifty elk, as many bear, five panthers and a few buffalo." The pelts were bought by the fur company at a nominal cost. Until the land was opened to white settlement by treaties with the Indians signed in 1851, south central Minnesota was undisputed hunting ground of the Indians.

Once the territory was thrown open, immigration began, slowly for a few years, increasing tremendously between 1856 and 1860, and continuing into the seventies. As in other counties, the pioneers came from many different states and from different countries of Europe. They arrived on foot, on horseback—families with oxen and covered wagons—a few with horse-drawn vehicles. They crossed the Mississippi River at Dubuque and came up from Iowa, they came down from the settlements of St. Anthony and St. Paul, they crossed the Mississippi River from La Crosse to Brownsville, Houston County, where the first regional land office was, later came by way of Chatfield where a second land office was established, and made their way as best they could to find land and new homes. Most of them were farmers, sturdy, hard-working folk. Soon there came craftsmen, artisans, newspapermen, lawyers, and doctors. They followed the pattern long established, from east to west in the United States, of building homes—crude at first, breaking roads, opening farms, establishing schools and churches, founding villages, developing businesses and professional practices. Unlike the counties bordering the Mississippi River, Mower County attracted few if any of the stragglers from river traffic, nor did the region interest lumbermen, bonanza farmers, or to any great extent, the large numbers of medical quacks who imposed upon the counties to the east.

In the autumn of 1852, claims were staked by some hunters and trappers from Iowa who soon left and did not return. The first permanent settlers were probably the fourteen persons of the "McQuillan group," of three related families who settled near Racine. They arrived on July 4, 1852, after a trek of about three months from Ohio, via Dubuque, with ox teams and wagons. Toward the close of 1853 many settlements were made along the Cedar River, Deer Creek, and the Iowa River, but by the end of the year there were fewer than twenty families in the county, and less than 100 bushels of grain had been raised. The pioneers, except the few who had money enough to purchase supplies in Iowa, depended chiefly for food on wild game. Austin Nichols, after whom the city of Austin was named, hunted along the Cedar River in 1852, and drove his first claim stake in 1854. A. B. Vaughan was near the site of Lansing that year, and there was a Norwegian farmer near the site of Brownsdale. Entries of land claims in the western part of the county were filed in September, 1855. In Pleasant Valley Township (northeastern Mower County) John S. Peirson and his brother Frederick M. Peirson filed on claims in the summer or autumn of 1854; according to one history, these were the first claims filed in Mower County.

Mower County had its political flurries. On May 22, 1857, "through the machinations of J. M. Berry, member of the Legislature, sections 1 to 6, inclusive, in town 104, of ranges 14 and 15, were cut off from Mower County and annexed to Olmsted County." This long narrow piece of land was the much disputed "Mile Strip." With its annexation to Olmsted County, many early settlers became residents of High Forest Township. With the organization of the county, and of towns, came the celebrated contest between Austin and Frankford for the honor of being the

county seat. It was then that the West Side and the East Side became official, each with its political ticket: the People's Ticket (West Side) and the Union Ticket (East Side). The story of the Tin Box Courthouse, the little box that contained the essential records—its shunting between Austin, Frankford, and High Forest through the efforts of the political spirits most nearly concerned, has been told well and often and appears in many accounts. It is of some interest here that in the first general election in the county, on October 14, 1856, Dr. Orlenzer Allen, the second physician in the county and the first in Austin (April, 1856), was the successful candidate for the office of coroner; the East Side had nominated a layman. Finally, on June 1, 1857, by vote of the people, Austin became the county seat.

The depression of 1857, largely due to overpromotion of the proposed railway lines and inflation of real estate values, caused severe hardship temporarily and delay in development of the county, but in due time stability returned, and with actual operation of the railroads after the Civil War steady progress began. In 1859 the population of the county was 3,700, of whom 400 were Norwegians, 200 Irish, and fifty German. By 1874, Scandinavians made up about one-fourth of the population.

Mower County early had newspapers, well listed in the general histories of the county. In those first decades and until the early eighteen eighties, when the practice fell into disuse, it was the custom for physicians, many of them at least, to publish not only statements of office address and hours, but also to give, sometimes in great detail, their professional qualifications, and accounts of work done and results obtained.

A Partial Roster of Practitioners of Medicine in Mower County (1855-1899)

Probably the first physician to practice in Mower County was a Thomsonian practitioner, J. C. Jones, who came to Le Roy Township in 1855. His wife also practiced medicine. After a few years they moved on to Missouri to engage in farming. In 1855 also, E. J. Kingsbury was in Bennington Township, but whether he then practiced medicine has not appeared. In 1860 he went to Spring Valley, Fillmore County, where he practiced for ten years; in 1870 he returned to Mower County and in Le Roy practiced for many years. In April, 1856, Orlenzer Allen came to Austin, the first physician in the city, to be followed in September of that year by John N. Wheat, who spent the remainder of his long life there. Hiram L. Coon came in 1856 to Austin, for five or six years. John L. Martin, preacher, physician and farmer, known in various counties of southern Minnesota, was in or near Frankford from 1856 to 1874. Joseph Alloys, physician, Catholic priest, and farmer, settled in Lansing in 1857, and probably in the same year Erastus Belden and his son, Wallace P. Belden came to Frankford from Hamilton, where they had arrived in 1853.

In the next few paragraphs is given, by decades of arrival and place or places of practice, a partial list of others of the approximately 146 physicians who came to Mower County before 1900. Some remained a lifetime, many left soon for other counties of the state or for other states.

1860-1869.—Sixteen physicians came to Mower County between 1860 and 1869. W. C. Jones settled in Austin in 1862 for some seventeen years. F. Brewer and a Dr. Huffman came to the city in 1863. Dr. Bingham came to Le Roy in 1865 and remained two years. Rensselaer Soule began practice in Lansing in 1865; he moved to Austin in 1875, and died there in 1880. The only arrival noted in 1866 was a Dr. Lafayette, who practiced in Lansing three years. In 1867 three physicians arrived who became outstanding members of the medical profession of the county: G. M. Allsdurff had an extensive practice at Le Roy for many years; O. W. Gibson was

a valued physician and surgeon of Austin until his death in 1896; W. L. Hollister, who arrived in Lansing in 1868, and settled in Austin in 1871, had a long and useful career which ended with his death in 1921. In 1868 J. W. Corbitt settled in Le Roy, where he practiced until his death in 1881. In the winter of 1869-1870, S. P. Thornhill and his son F. W. Thornhill came to Austin, where the senior physician died in 1879, after ten years of devoted service to the sick. In 1872 F. W. Thornhill removed to Spring Valley. Albert Plummer, a physician of merit, was in Hamilton from 1869 to 1893, and in Racine from 1893 to 1911. E. S. Gibbs perhaps was in Austin in 1869. P. C. Berry came to Austin in 1869. J. A. Allen settled in Austin probably in the late sixties. In 1869 he became a member of the Minnesota State Medical Society, the first member from Mower County.

1870-1879.—The eighteen seventies brought some thirty-seven medical newcomers of various types to Mower County. Most of them stayed from a few months to a year or two. Of the total number Austin received twelve, Brownsdale ten, Lyle and Grand Meadow four each, Dexter three, Rose Creek two, and Adams, Lansing and Taopi one each. A. Truane, the first to practice in Lyle, came in 1870, and was followed the same year by a Dr. Tanner. Neither stayed long. J. W. Eighmy was in Brownsdale for a few years beginning in 1871. The next year S. W. Jenks came to Grand Meadow, J. P. Squires to Austin, and O. Wheelock to Rose Creek; all became well known. R. W. Simmons, the first physician in Dexter, arrived in 1872 and stayed two or three years. Three practitioners came in 1874, one each to Brownsdale, Le Roy and Austin, but none remained more than a year or two. Three more, in the same category, came in 1875, and five more in 1876. Among the seven who arrived in 1877 were G. W. Gray (first in Grand Meadow) who stayed until 1883, later going to Brownsdale; and Lyman D. Jackson, in Dexter two years and in Grand Meadow from 1879 until his death, in 1892. Four came in 1878, two to Austin, two to Brownsdale, none of whom left lasting records; and 1879 brought three, none of whom stayed long.

1880-1889.—The eighties brought twenty-nine new practitioners to Mower County —to Austin, Brownsdale, Le Roy, Lyle, Taopi—in about the proportions of the distribution in the previous decade, and one to Frankford. Of this group, fourteen are named here. C. S. Beaulieu, well known in different counties in southern Minnesota, came to Brownsdale in 1880 for about ten years. W. M. Dodd, an able young physician, spent a period in 1880-1883 in that village. Emma Backus Fairbanks, a resident of Austin since 1861, qualified as a physician in 1881; she died in 1887. S. P. Meredith came to Austin in 1882 for a few years, left, and in 1902 returned for a few months. Thomas Phillips practiced in Austin from 1882 to 1886. In 1883 F. M. Johnson opened an office in Brownsdale; in 1885 he went to Grand Meadow, for five years. Alexander MacDonald practiced in Austin from 1883 to 1897. Of importance in Austin was W. H. McKenna, who came from successful practice in Caledonia (Houston County) and served the community well until his death in 1932. C. H. Johnson, in Austin, and H. L. Knight, in Le Roy and Adams, became outstanding physicians of the county beginning in 1884. A. W. Allen, a son of the pioneer physician Orlenzer Allen, began in Austin in 1885 a professional career that ended with his death in 1940; for a few years after 1887 his brother A. O. Allen was in practice with him. W. A. Frazer in 1885 began a long term of practice in Lyle. Sarah Catherine Wilcox practiced in Austin in 1866-1891. Annette Corneveaux (Finn) was in practice in Austin from 1887 until her death in 1896.

1890-1899.—The last decade of the Nineteenth Century added perhaps forty-six practitioners of medicine to the roster of Mower County. As in previous decades,

some were scarcely more than visitors, others spent many years here as useful citizens and well-loved physicians. Of the forty-six, Austin attracted twenty, Lyle five, Dexter four, Adams, Grand Meadow and Le Roy three each, Rose Creek two, and Brownsdale, Waltham and Madison one each. Concerning three of the possible practitioners, the record is obscure.

Emma Washburn (Rodgers) was in Austin from 1891 to about 1909. F. E. Daigneau was a successful physician in Austin from 1892 until 1937, the year of his death. G. W. Dahlquist spent the period 1893-1898 in Adams. Fanny G. Kimball Fiester had an active career in Austin from 1893 until her sudden death in 1938. D. F. O'Connor spent about six years in Grand Meadow from 1893 to probably 1899. In December, 1893, O. H. Hegge and his brother C. A. Hegge began in Austin their initial practice, soon widespread, in a partnership that continued about thirty-seven years; Dr. O. H. Hegge, the surviving brother, in 1960, is in his sixty-eighth continuous year of practice. W. F. Cobb, a general practitioner of the best type, lived in Lyle from 1895 to his death in 1932, but had been known and respected in Mower County since 1874, when he settled in near-by Mona, Iowa. J. J. Finn spent 1895 and 1896 in Austin. M. J. Hart and A. E. Henslin were two outstanding and staunch physicians who settled in Le Roy in 1895. Dr. Hart moved to California in 1921; Dr. Henslin remained in Le Roy until shortly before his death in 1950.

In Austin in the middle and late nineties were William Coburn, a Dr. Hanson, perhaps, and W. V. Hanscom. For a time Dr. Hanscom was in partnership with Dr. Coburn. In 1898 H. F. Peirson began his practice of forty-two years in Austin, and G. J. Schottler, fifty years of service in Dexter. J. S. Beagle came to Rose Creek in 1897 and stayed until 1909. In 1898, M. G. Millet joined M. J. Hart in Le Roy for two years. W. W. Freeman came to Grand Meadow from Caledonia in 1898 and remained until 1904. Emma Adeline Keeney, for a year or so in partnership with Dr. Fiester, was in Austin from about 1898 to 1899. W. N. Kendrick came from Spring Valley in 1898 to join C. H. Johnson in Austin, and in 1905 returned to Spring Valley. C. H. Robbins, long well-known in Fillmore County, came to Austin in 1898; his death occurred in 1900. O. C. Maercklin was in Adams in 1899, perhaps earlier.

Conditions of Practice

The physicians who came to Mower County between 1855 and 1900 must have represented a typical cross section of the medical men of their day and also of the pioneers who settled the West.

One of the most welcome additions to the population of a new country was the physician. Whatever his educational qualifications, his labors were important. He did the best he could in the conditions under which he worked. In the earliest years the physician had a limited armamentarium. He carried—in saddle bags, in buckboard, whatever his transportation in those days of no roads or poor trails—a few drugs; perhaps calomel, aloes, Dover's powder, opium, spirits of niter, Spanish fly, Peruvian bark, and whiskey; a little tin box of smallpox scabs to use in vaccination; lancets for bleed-letting, and knife and saw for amputations.

As stated, many of the physicians who came to Mower County left after a few weeks, months or years, for other counties or other states; in the early eighties many went on to Dakota Territory. Those who stayed became important figures in the growing settlements and the rural communities. In the fifties and sixties (during the panic of 1857 and the period of slow recovery after the Civil War) physicians in general must have had a trying time economically, for notices similar to the following appeared frequently in the newspapers: "Wanted: Will our customers

bring some wood, corn and oats. Dr. W. C. Jones." (*Mower County Transcript*, November 11, 1863.) Some physicians farmed as well as practiced medicine, some opened drugstores on the side or in connection with their practice. It was before the day of the great pharmaceutical companies, and many, if not most, practitioners compounded their own medicines. It may be said here that the early physicians were not only druggists but also, on occasion, oculists and opticians, and dentists. There were travelling "eye doctors" and also traveling dentists for some time before stable practitioners of the specialties became permanent residents.

An old history of the county lists the early physicians as being of the "old school," which in general meant, or came to mean, allopaths or members of the regular profession. There were representatives of the eclectic school, the homeopathic, the physiomedical, and others, and a few of the "magnetic" persuasion. Some had the best training available in their day. In previous articles on regional medicine in Minnesota, the medical education available in the first half or three fourths of the century has been described in detail, and the names given of many of the best of the medical schools in the East and in the Middle West in those years. The usual procedure was to study with a preceptor until the student had enough confidence to strike out in practice for himself; or to obtain instruction from a preceptor preliminary to the brief college or university courses in medicine then offered. There soon came into existence many worthless, so-called medical institutions that gave certificates of graduation, the "diploma mills," the "sheepskin factories," which equipped with "credentials" numberless practitioners who imposed on the population. As a logical result there came the itinerant practitioners, of some professional qualification, perhaps, and the errant quacks; in one county of Minnesota there was a mule driver who used the letters "M.D." after his name, for such profit and prestige as they might give.

In that early period came the medicine shows, which attracted a portion of the public who were more or less credulous. Others of the population were impressed by the pseudoscientific vocabulary used by some of the traveling gentry, and by the advertisements of patent medicines, almost astronomical in actual numbers and in the number of cures claimed for them of every ill known to mankind. In the earliest years, before the members of the profession became fully aware of the need for medical associations, and for medical legislation, to protect both the laity and themselves, there was little opposition to quackery, even on the part of the otherwise intelligent. Even in the middle of the Twentieth Century, there are members of the laity who apparently enjoy wandering the bypaths of irregular therapeutics.

The sincere physicians who gave their best and sought to improve, who made their permanent homes in Mower County, served the people well and won their respect and esteem. They were true pioneers and builders. Their names head the lists of civic leaders. Not only did they practice medicine conscientiously, they served in schools and churches, on township and village boards, as mayor of city and village, and, several of them, in the state legislature.

The following tribute, paid to the early physicians in the *History of Mower County* of 1884, is timely here:

> The medical fraternity of Mower County have, with few exceptions, been an honor to the profession. They have been ready to respond to the call of duty, mid summer's intense heat and the freezing blasts of winter. Nothing could cause them to turn a deaf ear to the cry of pain and suffering. They have been compelled to cross trackless prairies, to face blizzards from the Northwest, often with no hope of a fee or reward, but only, if possible, to relieve those who pleaded for their care and advice. All this has been done by the practicing physicians of Mower County, and that without a murmur or complaint. If the good deeds of this profession are not remembered by those who have received aid and life at their hands,

through such a train of hardships, a time will come when all will be remembered. The names of such men as Drs. Wheat, Hollister, Kingsbury, Alsdorf and others are mentioned in this chapter. It is hoped that the hearts which perhaps now beat in robust health, will be touched, and that all of the pioneers will respond, "May God bless them."

One can gain a glimpse of the life the early physicians led by reading the old records, newspapers and directories. Their offices usually were upstairs over a store where they had a "waiting room" and a consulting room. Their equipment was meager and they depended greatly on their own knowledge of disease, their keen perception of the signs of disordered health, and a deep understanding of the people they served. Their treatment for disease was largely empirical. Prior to 1900 the contagious diseases of childhood were always prevalent, and diphtheria particularly accounted for many tragic deaths. A physician's reputation often hinged on his success in treating the victims of an epidemic. Accidental injuries were common, and since methods of treatment were crude, many extremities were amputated. Some surgeons pointed with pride to the number of amputations they had performed. In general, however, surgical procedures were a minor part of the doctor's work, and the operations were performed in the homes of the patients; Mower County did not have a hospital until 1896. For the most part the physician's practice consisted of care of those ill with infections and contagious disease, treatment for injuries, delivering babies, and caring for those suffering from various chronic or "hopeless" diseases. As Dr. A. E. Henslin of Le Roy remarked in his later years, "We did the best we could with what we had." No one can do more, whether it be in 1860, 1900, 1957, or 1990.

The professional cards of the early physicians, in directories and in newspapers, often carried, in addition to address, two important items: "Office hours 1 to 3 p.m." and "Calls answered promptly, Day or Night." Their office hours necessarily were short, since they spent long hours making their extended rounds with horse and buggy, or horses and sleigh in winter, to visit patients in their homes. Few sick persons were brought to the office, few well persons consulted a physician.

Dr. Oliver Wendell Holmes graphically described the old doctor's daily routine:

Half a dollar a visit—drive, drive, drive all day; get up in the night and harness your own horse—drive again ten miles in a snowstorm; shake powders out of a vial—drive back again, if you don't happen to be stuck in a drift; no home, no peace, no continuous meals, no unbroken sleep, no Sunday, no holiday, no social intercourse, but eternal jog, jog, jog in a sulky.

(To be continued in the October issue)

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Bldg., Saint Paul 2, Minnesota

F. H. Magney, M.D.

Secretary

PHYSICIANS LICENSED FEBRUARY 20, 1959

January, 1959, Examination

Name	*School*		*Address*
AMPLATZ, Kurt	U. of Innsbruck, Austria	MD 1951	U. of Minn. Hosp., Mpls. 14, Minn.
AUSMAN, Robert K.	Marquette U.	MD 1957	U. of Minn. Hosp., Mpls. 14, Minn.
BROUILLET, Joffre	U. of Montreal	MD 1956	200 1st St. S.W., Rochester, Minn.
CARPENTER, Wm. Bradford	U. of Alberta	MD 1956	200 1st St. S.W., Rochester, Minn.
COOPER, Harold Geoffrey	U. Birmingham, Eng.	MB 1950	205 W. 2nd St., Duluth, Minn.
DALTON, Timothy Thomas Joseph	Creighton U.	MD 1955	200 1st St. S.W., Rochester, Minn.
DANG, Richard Wei Min	Northwestern	MD 1957	U. of Minn. Hosp., Mpls. 14, Minn.
DICKENS, Willis Norman	U. of Illinois	MD 1957	200 1st St. S.W., Rochester, Minn.
DYSART, Bonnar Wood	Leland Stanford Junior U.	MD 1956	200 1st St. S.W., Rochester, Minn.
GAERTNER, Frank M. J., Jr.	Marquette	MD 1958	806 E. 7th St., St. Paul, Minn.
HOHMANN, Albert	U. Marburg, Germany	MD 1953	9133 Rutherford, Detroit 28, Mich.
McCOLLISTER, Robert John	U. of Iowa	MD 1952	U. of Minn. Hosp., Mpls. 14, Minn.
MENGES, Hermann, Jr.	Western Reserve	MD 1957	200 1st St. S.W., Rochester, Minn.
MICHIE, James Lee	U. of Minn.	MD 1957	816 N. 36th St., Omaha 31, Nebr.
MURPHY, George Bernard	U. of Illinois	MD 1957	200 1st St. S.W., Rochester, Minn.
NICOLOFF, Demetre Matthew	Ohio State U.	MD 1957	U. of Minn. Hosp., Mpls. 14, Minn.
PACKARD, Dean Wilson	U. of Utah	MD 1957	200 1st St. S.W., Rochester, Minn.
RODLING, Heribert	U. of Innsbruck, Austria	MD 1952	200 1st St. S.W., Rochester, Minn.
SCHRANTZ, Robert Duane	Loyola U.	MD 1955	Park Rapids, Minn.
SCRUGGS, Thomas Murphy	Johns Hopkins	MD 1957	200 1st St. S.W., Rochester, Minn.
SMITH, Robert Dewey	U. of Colorado	MD 1957	200 1st St. S.W., Rochester, Minn.
TURCOTTE, Bernard	Laval U.	MD 1956	200 1st St. S.W., Rochester, Minn.
WACHS, Theodore James	Creighton	MD 1958	5244 Ewing Ave. So., Mpls. 10, Minn.
WOLD, Sidney Robert	U. Louisville	MD 1957	Miller Hosp., 125 W. College, St. Paul
ZITNIK, Ralph Sterle	Loyola U.	MD 1957	200 1st St. S.W., Rochester, Minn.

RECIPROCITY CANDIDATES

Name	*School*		*Address*
BIRDSALL, Charles Johnston	U. of Michigan	MD 1955	200 1st St. S.W., Rochester, Minn.
BRITT, Jr., Wilbur Frederick	U. of Arkansas	MD 1955	200 1st St. S.W., Rochester, Minn.
BROWNING, Richard James	W. Va. Univ. Med. Col.	MD 1956	200 1st St. S.W., Rochester, Minn.
CHISHOLM, Walter Scott, Jr.	U. Virginia	MD 1953	200 1st St. S.W., Rochester, Minn.
CULLEN, Robert Manson	Indiana U.	MD 1950	80 2nd St., Wells, Minn.
FARMER, Jr., John Lovelace	Duke Univ.	MD 1955	200 1st St. S.W., Rochester, Minn.
FEICHTER, Ralph Norbert	Northwestern	MD 1956	200 1st St. S.W., Rochester, Minn.
FERGUSON, Richard Harding	U. of Texas	MD 1948	200 1st St. S.W., Rochester, Minn.
GREGORY, Charles Hardy	Columbia U.	MD 1957	U. of Minn. Hosp., Mpls. 14, Minn.
HARRIS, John Edward	U. of Oregon	MD 1950	A-684 Mayo Mem. Hosp., Mpls. 14, Minn.
HARTZELL, John Mayo	U. of Michigan	MD 1957	200 1st St. S.W., Rochester, Minn.
HAWES, Charles Richard	U. of Oklahoma	MD 1946	Children's Hosp., 19th & Downing, Denver, Colo.
JENNINGS, Wilson Kenneth	Northwestern	MD 1957	200 1st St. S.W., Rochester, Minn.
KRABILL, Donald Robert	U. Cincinnati	MD 1957	200 1st St. S.W., Rochester, Minn.
LEHRER, Jr., Alfred John	St. Louis U., Mo.	MD 1958	Montgomery, Minn.
LUNDEEN, William Bruce	Med. Col. of Va.	MD 1955	U. of Minn., Minneapolis 14, Minn.
MANDSAGER, Robert Laurence	U. of Iowa	MD 1952	Mission Protestante, Meiganga, Cameroun, Africa
MARKOVITZ, Jack Marvin	U. of Illinois	MD 1947	2215 Plymouth Ave. N., Mpls. 11, Minn.
MARSHALL, Hiram William	Wayne State U.	MD 1952	200 1st St. S.W., Rochester, Minn.
MICHENFELDER, John Donahue	St. Louis U., Mo.	MD 1955	200 1st St. S.W., Rochester, Minn.
MORAN, Jr., Robert Emmett	Johns Hopkins	MD 1957	5115 Lowell Lane N.W., Washington, D. C.
REICHEL, Samuel Marvin	U. of Maryland	MD 1936	Vet. Adm. Hosp., Mpls. 17, Minn.
SORENSON, James Maclin	Marquette U.	MD 1954	200 1st St. S.W., Rochester, Minn.
SPALDING, John Arthur	Marquette U.	MD 1956	200 1st St. S.W., Rochester, Minn.
WARNER, John Sloan	Vanderbilt U.	MD 1956	U. of Minn. Hosp., Mpls. 14, Minn.
WARREN, John Walter	Creighton U.	MD 1954	200 1st St. S.W., Rochester, Minn.
WISINGER, Barney Mac	U. of Arkansas	MD 1954	200 1st St. S.W., Rochester Minn.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Name	*School*		*Address*
CASEY, Thomas H.	Northwestern	MD 1957	200 1st St. S.W., Rochester, Minn.
CRISP, Jr., Norman William	Harvard U.	MD 1953	U. of Minn. Hosp., Mpls. 14, Minn.
GODFREY, Thomas Edwin	Col. Med. Evang.	MD 1957	200 1st St. S.W., Rochester, Minn.
GOLDEN, Jules Samler	State U. of N. Y.	MD 1948	U. of Minn. Hosp., Mpls. 14, Minn.
KINNEY, Venard Robert	N. Y. Med. College	MD 1957	200 1st St. S.W., Rochester, Minn.
LIEBESMAN, Wm. Phillip	State U. of N. Y.	MD 1955	200 1st St. S.W., Rochester, Minn.
LONG, Jr., David Michael	Hahnemann Med. Col.	MD 1956	U. of Minn. Hosp., Mpls. 14, Minn.
MANNING, Jr., Preston Cocke	Yale U.	MD 1956	200 1st St. S.W., Rochester, Minn.
MASLANSKY, Robert Abraham	Columbia Col., N. Y.	MD 1956	Mpls. Gen. Hosp., Mpls. 15, Minn.
REESE, David Fulton	N. Y. Med. College	MD 1955	200 1st St. S.W., Rochester, Minn.
REYNOLDS, Raymond Donald	N. Y. Med. College	MD 1957	4119 E. Lake St., Minneapolis, Minn.
SHERIDAN, Lenore Alice	Northwestern	MD 1957	200 1st St. S.W., Rochester, Minn.
VAIL, David Jameson	Harvard	MD 1948	Minn. Dept. Wel., 117 Univ., St. Paul, Minn.
WEST, John Robert	Stanford U.	MD 1955	200 1st St. S.W., Rochester, Minn.

PHYSICIANS LICENSED MAY 8, 1959

April, 1959, Examination

Name	*School*		*Address*
BAILEY, Jr., Richard Jesse	U. of Wash.	MD 1957	200 1st St. S.W., Rochester, Minn.
CONVERY, F. Richard	U. of Wash.	MD 1958	859 Pacific Ave., Chehalis, Wash.
DERECHIN, William	U. of Manitoba	MD 1952	U. of Minn. Hosp., Mpls. 14, Minn.
GOODWIN, Andrew Wirt, II	U. of Michigan	MD 1957	200 1st St. S.W., Rochester, Minn.
HODGES, Jr., Paul Chesley	Johns Hopkins U.	MD 1955	U. of Minn. Hosp., Mpls. 14, Minn.
PAPPAS, Dennis George	U. Tennessee	MD 1958	Bellevue Hosp., 550 1st Ave., N. Y. 16, N. Y.
POPOWICH, John Gene	Jefferson Med. C.	MD 1958	Mpls. Gen. Hosp., Mpls. 15, Minn.
RICHARDSON, Harold Norman	U. of Rochester	MD 1954	107 W. Van Buren St., Oswego, N. Y.
TRUDEAU, Eugene Arthur	Manitoba Med. Co.	MD 1957	Langdon, No. Dakota
WINGERT, Marvin Edward	Marquette U.	MD 1958	Garretson, So. Dakota

RECIPROCITY CANDIDATES

Name	*School*		*Address*
ANDERSON, Jo Eagle	U. of Kansas	MD 1954	Elk River, Minn.
BILON, Thomas Edward	U. of Nebraska	MD 1953	319 6th St. W., Willmar, Minn.
BINDER, Jr., Gottfried H.	Temple U.	MD 1957	Mpls. Gen. Hosp., Mpls. 15, Minn.
BYRNE, Robert James	U. of Maryland	MD 1956	200 1st St. S.W., Rochester, Minn.
COX, Russell Lewis	Creighton U.	MD 1946	1602 Maplecrest Dr., Estherville, Iowa
DODDS, Joseph James	U. of Pittsburgh	MD 1955	200 1st St. S.W., Rochester, Minn.
DUNSTAN, Paul Lane	Baylor U.	MD 1939	326 W. 6th St., Willmar, Minn.
FOX, Jr., Nelson Moffett	Med. Col. of Va.	MD 1955	200 1st St. S.W., Rochester, Minn.
HELM, Walter Jackson	Temple U.	MD 1957	200 1st St. S.W., Rochester, Minn.
McENANEY, James Earl	St. Louis U., Mo.	MD 1956	127 W. Vine St., Owatonna, Minn.
MUNTZ, Keith Stickler	Western Reserve	MD 1955	200 1st St. S.W., Rochester, Minn.
MYERS, William Richard	U. of Iowa	MD 1954	200 1st St. S.W., Rochester, Minn.
TODD, John Charles	U. of Illinois	MD 1952	St. Olaf Hosp., 908 Lansing, Austin. Minn.
YADUSKY, Donald Peter	Jefferson U.	MD 1957	200 1st St. S.W., Rochester, Minn.

NATIONAL BOARD CANDIDATES

Name	*School*		*Address*
CHAIMOV, Alan Lucien	U. of Oregon	MD 1954	200 1st St. S.W., Rochester, Minn.
HERBER, Leo	Col. Med. Evang.	MD 1956	109 S. Labree, Thief River Falls, Minn.
RUFFOLO, Eugene Henry	Georgetown U.	MD 1949	200 1st St. S.W., Rochester, Minn.

PHYSICIANS LICENSED JULY 17, 1959

June, 1959, Examination

Name	*School*		*Address*
ALBRECHT, Raymond John	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.
ANDERSON, Dale LaVern	U. of Minnesota	MD 1959	Bethesda Hosp., St. Paul 1, Minn.
ANDERSON, Freedolph Deryl	U. of Minnesota	MD 1959	San Diego Co. Gen. Hosp., San Diego, Cal.
APPELBAUM, Bradley E.	U. of Minnesota	MD 1959	Ancker Hosp., St. Paul 1, Minn.
ARKO, Jr., Frank Robert	U. of Minnesota	MD 1959	St. Luke's Hosp., Duluth, Minn.
ARLANDER, Thomas Raynor	U. of Minnesota	MD 1959	U. of Miss. Hosp., Jackson, Miss.
AUGHENBAUGH, John Wallace	U. of Minnesota	MD 1959	Mpls. Gen. Hosp., Mpls. 15, Minn.
BANOVETZ, John Doyle	U. of Minn. Med. Sc.	MD 1959	King Co. Hosp., Seattle, Wash.
BENDEL, Richard Phillip	U. of Minnesota	MD 1959	Mpls. Gen. Hosp., Mpls. 15, Minn.
BERNSTEIN, William E.	U. of Minnesota	MD 1959	Cedars of Lebanon Hospital 4833 Fountain Ave., Los Angeles 29, Cal.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Name	*School*		*Address*
BERRY, Ronald Neil	U. of Minnesota	MD 1959	Bethesda Hosp., 559 Capitol Blvd., St. Paul 1, Minn.
BLOOM, Phillip Myron	U. of Minnesota	MD 1959	Edward J. Meyer, Mem. Hospital, Buffalo, N. Y.
BLUMENTALS, Ausma S.	U. of Minnesota	MD 1959	Chas. T. Miller Hospital, 125 W. College, St. Paul 2, Minn.
BROUSSARD, William Jos.	U. of Minnesota	MD 1959	Letterman Army Hosp., San Francisco, Cal.
CAMPBELL, John Blake	U. of Minnesota	MD 1959	Womack Army Hosp., Ft. Bragg, N. C.
CHRISTENSON, Carl Eugene	U. of Minnesota	MD 1959	Bethesda Hosp., St. Paul 1, Minn.
COLPITTS, Grant Elliott	U. of Manitoba	MD 1945	St. Luke's Hosp., Duluth, Minn.
CORSON, Wilfred Alan	U. of Minnesota	MD 1959	King Co. Hosp., Seattle, Wash.
DALE, Robert Tatum	U. of Minnesota	MD 1959	Wayne Co. Gen. Hosp., Eloise, Mich.
DAVIDSON, Allan Dale	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.
DAVIS, Michael Wm.	U. of Minnesota	MD 1959	U. S. Public Health Service Hosp., San Francisco, Cal.
De REMEE, Richard Arthur	U. of Minnesota	MD 1959	Wm. Beaumont Army Hosp., El Paso, Tex.
DREDGE, Jr., Thomas Everett	U. of Minnesota	MD 1959	Mt. Sinai Hosp., Minneapolis, Minn.
DRILL, David Karl	U. of Minnesota	MD 1959	Mpls. Gen. Hosp., Mpls. 15, Minn.
ECKMAN, Philip Linner	U. of Minnesota	MD 1959	Denver Gen. Com. Hosp., Denver, Colo.
ELEVITCH, Franklin Ray	U. of Minnesota	MD 1959	Mercy Hosp., 2221 Madison, Toledo, Ohio
EVERS, Carl Gustav	U. of Minnesota	MD 1959	U. of Miss. Hosp., Jackson, Miss.
FLORY, Sonja Myhre	U. of Minnesota	MD 1959	Highland-Alameda Hospital, 2701 14th Ave., Oakland, Calif.
FLORY, William Daniel	U. of Minnesota	MD 1959	Highland-Alameda Hosp., Oakland, Cal.
FLUTH, Jerome Conrad	U. of Minnesota	MD 1959	St. Luke's Hosp., Duluth, Minn.
FORD, Jr., Wm. Pendleton	U. of Wash., Seattle	MD 1958	Vet. Adm. Hosp., Mpls. 17, Minn.
FRIEDRICH, Bradford Edward	U. of Minnesota	MD 1959	Highland-Alameda Hosp., Oakland, Cal.
GERDES, Arthur James	U. of Minnesota	MD 1959	King Co. Hosp. System, Seattle, Wash.
GOLDFARB, Benjie L.	U. of Minnesota	MD 1959	Peter Bent Brigham Hospital, 721 Huntington Ave.. Boston. Mass.
GORCHYNSKI, Orest	U. of Manitoba	MD 1957	103-S.W. 2nd St., Milaca, Minn.
GOVRIK, Kalman	U. of Budapest, Hungary	MD 1942	486 Dale St., St. Paul 3, Minn.
GREENBERG, Lawrence Miles	U. of Minnesota	MD 1959	U. of Minn. Hospitals Ped. Dept., Mpls. 14, Minn.
HAFERMANN, Mark David	U. of Minnesota	MD 1959	King Co. Hospital, Seattle, Wash.
HALVERSON, Kenneth	U. of Minnesota	MD 1959	Mercy Hospital, Toledo, Ohio
HARNER, Richard Neal	U. of Minnesota	MD 1959	Ancker Hospital, St. Paul 1, Minn.
HENDRICKSON, John M.	U. of Minnesota	MD 1959	Mercy Hosp. 2221, Madison, Toledo, O.
HERBERG, James Peter	U. of Minnesota	MD 1959	Gorgas Hsp., Balboa Hts., Canal Zone
HETZLER, John Arnold	U. of Minnesota	MD 1959	Bethesda Hosp., St. Paul 1, Minn.
HIATT, John Alfred	U. of Minnesota	MD 1959	St. Mary's Hosp., Duluth, Minn.
HILL, Charlotte Weeks	U. of Minnesota	MD 1959	Miller Hsp., 125 W. College, St. Paul
HUBBARD, Jack Otto	U. of Minnesota	MD 1959	St. Mary's Hosp., Duluth, Minn.
JANECEK, Jr., James	U. of Minnesota	MD 1959	Ancker Hospital, St. Paul 1, Minn.
JOHNSON, Carl E.	U. of Minnesota	MD 1959	St. Luke's Hosp., 1580 Valencia St., San Francisco, Cal.
JOHNSON, Franklin Leroy	U. of Minnesota	MD 1959	Mercy Hospital, Toledo, Ohio
JOHNSON, Thomas Russell	U. of Minnesota	MD 1959	USPHS Hosp., 210 State, New Orleans, La.
KANE, Morton Curtis	U. of Minnesota	MD 1959	Highland-Alameda Hosp., Oakland, Cal.
KANE, William James	Columbia U.	MD 1958	U. of Minn. Hospitals, Mpls. 14, Minn.
KEITH, Donald M.	U. Wash. Seattle	MD 1958	Contra Casta Co. Hosp., Martinez, Cal.
KELLY, Helen M.	U. of Minnesota	MD 1959	Ancker Hospital, St. Paul 1, Minn.
KIEFFER, Stephen Aaron	U. of Minnesota	MD 1959	Vet. Adm. Hosp., Wilshire at Sawtelle Blvd., Los Angeles, Cal.
KRATOCHVIL, Bernard Lee	Creighton U.	MD 1957	Vet. Adm. Hosp., Minneapolis 17, Minn.
KVAM, Lowell Leon	U. of Minnesota	MD 1959	Bethesda Hosp., St. Paul 1, Minn.
LANE, Miles Irving	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
LARSEN, Russell Harry	U. of Minnesota	MD 1959	St. Luke's Hosp., Denver, Colorado
LARSON, Roger Keith	U. Wash., Seattle	MD 1958	341 Farallone (Fircrest), Tacoma 66, Wash.
LEES, David Cameron	Northwestern U.	MD 1958	1328 2nd Ave. So., Fargo, No. Dakota
LEIGHTON, John Shorten	U. of Minnesota	MD 1959	San Diego Co. Gen. Hosp., San Diego, Cal.
LINDELAND, Arthur T.	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
LITMAN, Thomas	U. of Minnesota	MD 1959	U. Pittsburgh Health Center, Pittsburgh, Pa.
LOVRIEN, Everett Winslow	U. of Minnesota	MD 1959	San Diego Co. Gen. Hosp., San Diego, Cal.
LOWE, Douglass Arnold	U. of Minnesota	MD 1959	U. of Minn. Hospitals, Mpls. 14, Minn.
LUNDBORG. Richard Oliver	U. of Minnesota	MD 1959	1016 4th Ave., Madison, Minn.
LUNDQUIST, Charles Bartholow	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.
MARTELL, Charles J.	U. of Minnesota	MD 1959	So. Pacific Gen. Hosp., 1400 Fell St., San Francisco, Cal.
MARTINSON, Raymond Marvin	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
MARYLAND, Daniel Ludvic	U. of Minnesota	MD 1959	St. Mary's Hosp., Duluth, Minn.
MAYER, Paul David	U. of Minnesota	MD 1959	St. Mary's Hosp., Minneapolis, Minn.
McCREARY, Charles Bost	U. of Minnesota	MD 1959	St. Louis Co. Hosp., Clayton 5, Mo.
McGEE, Robert Courtland	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
McKINNON, James Andrew	U. of Minnesota	MD 1959	St. Mary's Hosp., Minneapolis, Minn.
MELAND, Richard Andrew	U. of Minnesota	MD 1959	Wm. Beaumont Hosp., El Paso, Texas

Name	*School*		*Address*
MEYER, Melvin Eugene	U. of Minnesota	MD 1959	St. Mary's Hospital, Minneapolis 6, Minn.
MOSS, Jr., Norman Wm.	U. Wash., Seattle	MD 1958	2005 Monroe, Pullman, Wash.
MUESING, Mark Alan	U. of Minnesota	MD 1959	St. Mary's Hosp., Duluth, Minn.
MULROONEY, Thos. Francis	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
NAGOBADS, Ilgvars Janis	U. of Minnesota	MD 1958	Vet. Adm. Hosp., Minneapolis 17, Minn.
NELSON, Rodger Keith	U. of Minnesota	MD 1959	St. Albans Naval Hosp., L. I., New York
NELSON, Ronald J.	U. of Minnesota	MD 1959	King Co. Hosp. System. Seattle. Wash.
NICHOLS, Thomas Owen	U. of Minnesota	MD 1959	Miller Hosp., 125 W. College, St. Paul, Minn.
NIELSEN, David James	U. of Minnesota	MD 1959	San Joaquin Hosp., Box 1890, French Camp, Cal.
O'BRIEN, Bruce James	Marquette U.	MD 1958	651 Sumner St., St. Paul 16, Minn.
OLMANSON, Vern Clare	U. of Minnesota	MD 1959	Ancker Hospital, St. Paul 1, Minn.
ORN, Duane Lynn	U. of Minnesota	MD 1959	Mercy Hosp., 2221 Madison, Toledo, O.
OSLUND, Richard Robert	U. of Minnesota	MD 1959	St. Luke's Hospital, Duluth, Minn.
PLORDE, James Joseph	U. of Minnesota	MD 1959	King Co. Hosp., Seattle, Wash.
POWERS, Robert Lowell	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.
PRICKMAN, Wm. Edward	U. of Minnesota	MD 1959	St. Mary's Hospital, Duluth, Minn.
PUUMALA, Barbara Meyer	U. of Minnesota	MD 1959	St. Luke's Hsp., 915 E. 1st, Duluth
PUUMALA, Ricard Reino	U. of Minnesota	MD 1959	St. Luke's Hospital, Duluth, Minn.
RATINOV, Gerald	U. of Minnesota	MD 1959	Vet. Adm. Center, Los Angeles, Calif.
RILEY, John Daniel	U. of Minnesota	MD 1959	U. S. Naval Hosp., Oakland, Calif.
RINGHOFER, Lawrence R.	U. of Minnesota	MD 1959	303 N. Grove St., Owatonna, Minn.
ROGERS, Donald Robert	U. Wash., Seattle	MD 1958	4311 S. Asotin St., Tacoma 8, Wash.
ROLLER, Franklin Delano	U. of Minnesota	MD 1959	U.S.P.H.S. Hosp., Seattle, Wash.
RUSS, Homer Hugh	U. of Minnesota	MD 1959	Bethesda Hosp., St. Paul 1, Minn.
SADOFF, Robert Leslie	U. of Minnesota	MD 1959	Vet. Adm. Hsp., Los Angeles 25, Cal.
SANTRIZOS, Harry P.	U. of Minnesota	MD 1959	Detroit Memorial Hospital, 1420 St. Antoine St., Detroit 26, Mich.
SCHAMBER, Dean Thomas	U. of Minnesota	MD 1959	76 Adam Way, Atherton, Calif.
SCHMALHORST, Wm. Randolph	U. of Minnesota	MD 1959	Springfield City Hsp., Springfield, O.
SELJESKOG, Edward Louis	U. of Minnesota	MD 1959	Ancker Hosp., St. Paul 1, Minn.
SIMSO, Lee Arnold	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
SKAFF, George	U. of Minnesota	MD 1959	Santa Clara Co. Hsp., San Jose, Cal.
SMITH, Darline D.	U. of Minnesota	MD 1959	Highland-Alameda Co. Hsp., Oakland, Cal.
SPELLACY, Wm. Nelson	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
STRAIT, Herbert Stuart	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
SWALLEN, Thomas O.	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
SWANSON, Richard L.	U. of Minnesota	MD 1959	Womack Army Hsp., Ft. Bragg, No. Car.
TELANDER, Robert Lawrence	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
TESKA, Byron Adolph	U. of Minnesota	MD 1959	Minneapolis Gen. Hsp., Mpls. 15, Minn.
THAL, Ben	U. Wash., Seattle	MD 1958	Minneapolis Gen. Hsp., Mpls. 15, Minn.
THOMPSON, Charles Eugene	U. of Minnesota	MD 1958	Vet. Adm. Hosp., Mpls. 17, Minn.
THOMPSON, Gail Wesley	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.
THOMPSON, James R.	U. of Minnesota	MD 1959	St. Luke's Hosp., Duluth, Minn.
TOYAMA, Roy	U. of Minnesota	MD 1959	St. Luke's Hosp., Duluth, Minn.
TRELLE, Hans Dietrich Karl	Erlangen U., Germany	MD 1954	200 1st St., S.W., Rochester, Minn.
TUNA, Naip	U. Istanbul, Turkey	MD 1947	U. of Minn. Dept. Med., Mpls. 14, Minn.
TUOHY, Gerald Francis	U. of Minnesota	MD 1959	U.S.P.H.S. Hosp., New Orleans, La.
WHITE, Richard Lowell	U. of Minnesota	MD 1959	Boston City Hosp., 818 Harrison, Boston 18, Mass.
WIENS, Alvin Leo	U. of Minnesota	MD 1959	St. Luke's Hosp., Duluth, Minn.
WILSON, Jr., John Allen	U. of Minnesota	MD 1959	Minneapolis Gen. Hosp., Mpls. 15, Minn.
WINTER, Robert Bruce	Wash. U., St. Louis	MD 1958	U. of Minn. Hospitals, Mpls. 14, Minn.
WYMORE, Robert Adolphus	U. of Minnesota	MD 1959	Mercy Hsp., 2221 Madison, Toledo, O.
YLITALO, Elmer Waldemar	U. of Minnesota	MD 1959	Fitzsimons Army Hosp., Denver 30, Colo.
ZACHMAN, John F.	U. of Minnesota	MD 1959	St. Joseph's Hosp., St. Paul 2, Minn.

RECIPROCITY CANDIDATES

Name	*School*		*Address*
BROWN, Howard S.	Indiana U.	MD 1958	Rolling Prairie, Ind.
BRYANT, Emmett Phillips	U. of Arkansas	MD 1943	101 1st Ave. S.W., Chisholm, Minnesota
DITTO, Winston Blaine	U. of Iowa	MD 1953	200 1st St. S.W., Rochester, Minn.
FERGUSON, John Norton	Wash. U., St. Louis	MD 1957	Vet. Adm. Hospital, Mpls. 17, Minn.
GANS, Ida Henriette	Stanford U	MD 1955	427 4th St. S.E., Minneapolis 14, Minn.
HAGBERG, Norman Lyle	U. of Nebraska	MD 1958	105 S. 1st St., Montevideo, Minn.
HOFFMEISTER, Rex Todd	U. Nebraska	MD 1955	200 1st St. S.W., Rochester, Minn.
JOHNSON, Lowell Arthur	U. of Oregon	MD 1953	200 1st St. S.W., Rochester, Minn.
KAESE, Werner Erich	U. of Maryland	MD 1953	1822 17th St. N.W., Rochester, Minn.
LAUTER, Eric Wolfgang	U. of Chicago	MD 1951	Vet. Adm. Hospital, Altoona, Pa.
MARSO, John Lawrence	St. Louis U. Mo.	MD 1953	Main & Broad St., Mankato. Minn.
OFFICER, Charles Dickens	State U., Iowa	MD 1954	656 W. Old Shakopee Rd., Bloomington, Minneapolis 20, Minn.
POLLMAN, Stanley Eugene	U. of Nebraska	MD 1956	109 LaBree Ave. S., Thief River Falls, Minn.
SPENCER, David Leo	St. Louis U., Mo.	MD 1958	7126 Chicago Ave. So., Minneapolis, Minn.
YELLE, Matthew David	U. Pittsburgh	MD 1955	1833 2nd Ave. S., Anoka, Minn.

NATIONAL BOARD CANDIDATES

Name	*School*		*Address*
DREXLER, Charles John	Creighton	MD 1958	35 E. 4th St., Litchfield, Minnesota
ELIAS, Richard Abraham	Columbia U	MD 1955	200 1st St. S.W., Rochester, Minn.
FISCH, James Martin	U. of Illinois	MD 1958	Michael Reese Hospital, Chicago 16, Ill.
KAPLAN, Carl	U. of Chicago	MD 1956	200 1st St. S.W., Rochester, Minn.
LUSHBOUGH, Bruce Calvert	Jefferson Med Col.	MD 1958	481 Oaklawn Ave., Apt. "A", Chula Vista, California
MORIARTY, James Aloysius	Marquette U.	MD 1954	U. of Minn. Hospitals, Minneapolis 14, Minn.
REEBER, Erick	U. of Buffalo	MD 1956	318 LaBree Ave. S., Thief River Falls, Minn.
THURN, Roy Joseph	U. of Buffalo	MD 1952	5601 Grand Ave., Duluth Minn.
VAN HORN, Paul Emerson, Jr.	N. Y. Med. College	MD 1955	200 1st St. S.W., Rochester, Minn.
WANG, Yang	Harvard, Boston	MD 1952	U. of Minn. Hospitals, Minneapolis 14, Minn.
YAMAGUCHI, Donald Mitsuo	Harvard, Boston	MD 1957	200 1st St. S.W., Rochester, Minn.

PHYSICIANS LICENSED NOVEMBER 6, 1959

October, 1959, Examination

Name	*School*		*Address*
BARRY, George John	Marquette U.	MD 1955	403 1st St. N.W., Chisholm, Minn.
BIGGS, Alfred DeBard, Jr.	Northwestern	MD 1958	200 1st St. S. W., Rochester, Minn.
BROOKLER, Morton Irving	U. of Manitoba	MD 1958	200 1st St. S.W., Rochester, Minn.
BROWN, David Norman	U. of Manitoba	MD 1957	200 1st St. S.W., Rochester, Minn.
CAMPBELL, Frederick Wm., Jr.	Cornell U.	MD 1953	609 Medical Arts Bldg., Minneapolis, Minn.
DUMONT, Guy	U. of Montreal	MD 1956	200 1st St. S.W., Rochester, Minn.
DYCK, Peter J.	U. of Toronto	MD 1955	200 1st St. S.W., Rochester, Minn.
ENGSTROM, George Frederick	U. of Minnesota	MD 1928	State Hospital, St. Peter, Minn.
FILIATRAULT, Louis Joseph, Jr.	Loyola U.	MD 1959	St. Mary's Hospital, Duluth, Minn.
FRISCHKNECHT, Albert	U. Berne, Switzerland	MD 1957	200 1st St. S.W., Rochester, Minn.
HENCH, Philip Kahler	U. of Pittsburgh	MD 1958	200 1st St. S.W., Rochester, Minn.
HERSHFIELD, Earl Samuel	U. of Manitoba	MD 1958	Winnipeg General Hospital, Winnipeg, Man.
HOFFMAN, Gerald George	Northwestern	MD 1956	Minneapolis Gen. Hsp., Mpls., Minn.
JOHNSON, Leonard Morris	U. of Pennsylvania	MD 1958	200 1st St. S.W., Rochester, Minn.
JOYCE, John William	Loyola U.	MD 1955	200 1st St. S.W., Rochester, Minn.
KAUL, Lothar	U. Marburg, Germany	PHY. 1952	1600 S. Western Ave., Sioux Falls, S. D.
KECK, Stanley Walter	Northwestern	MD 1955	200 1st St. S.W., Rochester, Minn.
LENZ, Bernard William	Loyola U.	MD 1958	Rosebud, South Dakota
MALLOY, John Joseph	Ottawa U.	MD 1957	200 1st St. S.W., Rochester, Minn.
MARCEAU, Picard	Laval U. of Quebec	MD 1958	200 1st St. S.W., Rochester, Minn.
NIRSCHL, Robert Phillip	Marquette U.	MD 1958	200 1st St. S.W., Rochester, Minn.
POPPIE, Robert William	U. of Maryland	MD 1955	507 Wash. St., Brainerd, Minn.
RULON, John Thomas	McGill U.	MD 1955	200 1st St. S.W., Rochester, Minn.
SADD, Milton Franklin	U. of Minnesota	MD 1959	St. Joseph's Hospital, St. Paul 2, Minn.
SILVERSTEIN, Emanuel	New York State U.	MD 1954	512 Delaware St., S.E., Minneapolis, Minn.
SIMONS, John Nelson	U. of Pennsylvania	MD 1958	200 1st St. S.W., Rochester, Minn.
SUKKAR, Fouad	Alexandria U., Egypt	MB 1955	Fulda, Minnesota
SWANSON, D. Douglas	Bowman-Gray, NC.	MD 1958	3017 Bloomington Ave., Minneapolis, Minn.
TANASICHUK, Murray Arthur	U. of Manitoba	MD 1952	U. of Minn. Hospitals, Minneapolis 14, Minn.

RECIPROCITY CANDIDATES

Name	*School*		*Address*
ADE, Ralph Duane	U. of Illinois	MD 1955	200 1st St. S.W., Rochester, Minn.
AMUNDSEN, Melvin A.	Northwestern	MD 1958	200 1st St. S.W., Rochester, Minn.
ANDERSON, Roland Gustav	U. of Illinois	MD 1952	318 LaBree Ave., Thief River Falls, Minn.
ASHMORE, Herbert Cleveland	Indiana U.	MD 1951	200 1st St. S.W., Rochester, Minn.
BERKE, Joseph Jerold	U. of Michigan	MD 1957	200 1st St. S.W., Rochester, Minn.
BROWN, Arnold L., Jr.	Med. Col. of Va.	MD 1949	200 1st St. S.W., Rochester, Minn.
BURK, Emmett Kay	U. of Missouri	MD 1958	200 1st St. S.W., Rochester, Minn.
CARLILE, Wm. Kirkbride, Jr.	Jefferson Med.	MD 1952	200 1st St. S.W., Rochester, Minn.
CHAMBERLAIN, Jacques Kenneth	U. of Illinois	MD 1954	200 1st St. S.W., Rochester, Minn.
COHEN, David Frank	U. of Toronto	MD 1957	200 1st St. S.W., Rochester, Minn.
COYLE, Richard Raymond	Stanford U.	MD 1956	200 1st St. S.W., Rochester, Minn.
FATUM, Paul James	Vanderbilt U.	MD 1958	200 1st St. S.W., Rochester, Minn.
FINLEY, Marcus L.	U. of Texas	MD 1956	200 1st St. S.W., Rochester, Minn.
FINLEY, Mona McMurry	U. of Texas	MD 1958	800 5th Ave., Suite 517, Ft. Worth, Texas
GALLOWAY, Jackson Rountree	La. State U.	MD 1955	200 1st St. S.W., Rochester, Minn.
GREGG, James Alan	U. of Rochester	MD 1954	200 1st St. S.W., Rochester, Minn.
HAUSER, Walter Henry	Ohio State U.	MD 1958	200 1st St. S.W., Rochester, Minn.
HOLBROOK, Margaret A.	Wayne State U.	MD 1958	200 1st St. S.W., Rochester, Minn.
JONES, Ralph Homer	Washington U., Missouri	MD 1946	200 1st St. S.W., Rochester, Minn.
KNOBLOCH, Wm. Hunter, Jr.	U. of Oklahoma	MD 1952	North Memorial Hosp., Minneapolis, Minn.
KRUPP, Neal Edward	St. Louis U.	MD 1955	200 1st St. S.W., Rochester, Minn.

Name	*School*		*Address*
LAUVSTAD, Walter Armin	U. of Iowa	MD 1958	200 1st St. S.W., Rochester, Minn.
LEE, John Wood	Indiana U.	MD 1955	200 1st St. S.W., Rochester, Minn.
LEE, Ling Hong	Baylor U.	MD 1958	200 1st St. S.W., Rochester, Minn.
LEE, Raymond Allen	Indiana U.	MD 1958	200 1st St. S.W., Rochester, Minn.
LEVINE, Stanley David	Iowa State U.	MD 1954	U. of Minn. Hospitals, Minneapolis 14, Minn.
LONGERBEAM, Jerrold K.	U. of Louisville	MD 1948	U. of Minnesota, Minneapolis 14, Minn.
LYNE, Benjamin William	U. of Wisconsin	MD 1953	200 1st St. S.W., Rochester, Minn.
MAGNUSON, Frederick King	U. of Colorado	MD 1958	200 1st St. S.W., Rochester, Minn.
MARTIN, John Harvey	Temple U.	MD 1958	200 1st St. S.W., Rochester, Minn.
MASSEY, Ben Davis, Jr.	U. of So. Calif.	MD 1958	200 1st St. S.W., Rochester, Minn.
McCORMICK, Patrick Joseph	U. of Wisconsin	MD 1958	200 1st St. S.W., Rochester, Minn.
McNAMARA, John Patrick	St. Louis U. of Mo.	MD 1944	17 Rogers Road, St. Cloud, Minn.
MEANY, Thomas James	Creighton U.	MD 1954	425 40th Ave. N.E., Minneapolis 21, Minn.
MEEKIN, Patrick Claire	Creighton U.	MD 1954	425 40th Ave. N.E., Minneapolis 21, Minn.
METGE, William Ray	U. of Iowa	MD 1956	200 1st St. S.W., Rochester, Minn.
MULLADY, III, Thos. Francis	Johns Hopkins	MD 1955	200 1st St. S.W., Rochester, Minn.
NEAULT, Roger William	U. of Michigan	MD 1955	200 1st St. S.W., Rochester, Minn.
NELSON, Frank Frederick	U. of Wisconsin	MD 1950	501 S. State St., New Ulm, Minn.
PARSHALL, William Andrew	Harvard U.	MD 1955	200 1st St. S.W., Rochester, Minn.
PATTERSON, Richard Joseph	Temple U.	MD 1958	200 1st St. S.W., Rochester, Minn.
PULEC, Jack Lee	U. of Nebraska	MD 1957	200 1st St. S.W., Rochester, Minn.
SANDERSON, David Robert	Northwestern	MD 1958	200 1st St. S.W., Rochester, Minn.
SARGEANT, Charles D.	Northwestern	MD 1955	1825 New York Ave., Manitowoc, Wis.
SHAMBLIN, Jr., James Roscoe	Tulane U.	MD 1958	200 1st St. S.W., Rochester, Minn.
SHEETS, Joseph Louis	Temple U.	MD 1958	200 1st St. S.W., Rochester, Minn.
SPENCER, Steven S.	U. of Pennsylvania	MD 1955	200 1st St., S.W., Rochester, Minn.
STEWART, James Richard	State U. of Iowa	MD 1957	200 1st St., S.W., Rochester, Minn.
TEMPLETON, Mary Joan	U. of Michigan	MD 1958	200 1st St., S.W., Rochester, Minn.
TUTTON, Roger Headly	State U. of Iowa	MD 1955	200 1st St., S.W., Rochester, Minn.
VOGEL, Melvin Dean	Indiana U.	MD 1958	200 1st St., S.W., Rochester, Minn.
WALTERS, Edward W.	Wayne State U.	MD 1958	200 1st St., S.W., Rochester, Minn.
WEINSTEIN, Eugene Carl	U. of Illinois	MD 1956	200 1st St., S.W., Rochester, Minn.
WHITAKER, John Joseph	Creighton U.	MD 1958	200 1st St., S.W., Rochester, Minn.

NATIONAL BOARD CANDIDATES

Name	*School*		*Address*
BAKER, John Herbert	Tufts Medical College	MD 1594	106½ N. Minnesota, New Ulm, Minn.
BECKER, Kenneth Louis	New York Med. Col.	MD 1956	200 1st St. S.W., Rochester, Minn.
BENSON, Arnold Norman	New York Med. Col.	MD 1958	200 1st St. S.W., Rochester, Minn.
BROOKS, Leonard Joseph	Northwestern U.	MD 1955	401-5 1st St. S., Virginia, Minn.
CAMP, Jr., John Dexter	U. of So. California	MD 1958	200 1st St. S.W., Rochester, Minn.
COLES, Douglas Terry	McGill U.	MD 1958	200 1st St. S.W., Rochester, Minn.
D'AGOSTINO, Anthony N.	U. of Buffalo	MD 1958	200 1st St. S.W., Rochester, Minn.
DAMRON, John Charles	U. of Cincinnati	MD 1958	200 1st St. S.W., Rochester, Minn.
DINAPOLI, Robert Paul	Stanford U.	MD 1958	200 1st St. S.W., Rochester, Minn.
DICKSON, Harrison McCrea	U. of Pennsylvania	MD 1958	200 1st St. S.W., Rochester, Minn.
DILLON, John Francis	Geo. Washington U.	MD 1947	U. of Minn. Hospitals, Minneapolis 14, Minn.
FONS, Anthony Ludwig, III	Yale U.	MD 1957	200 1st St. S.W., Rochester, Minn.
GENOVA, M. Leonard	Albany Med Col.	MD 1948	132 E. Bergen Place, Red Bank, N. J.
GOETHALS, Paul Lawrence	Loyola U.	MD 1958	200 1st St. S.W., Rochester, Minn.
GUTMAN, Arnold Avram	Hahnemann Med. Col.	MD 1955	200 1st St. S.W., Rochester, Minn.
HAWKINSON, Harlan Winslow	Northwestern	MD 1955	Vet. Adm. Hosp., Minneapolis 17, Minn.
HESS, Carroll Norman	U. of Rochester	MD 1956	Vet. Adm. Hosp., Minneapolis 17, Minn.
HOLLEY, Keith Edward	Col. of Med. Evang.	MD 1957	200 1st St. S.W., Rochester, Minn.
HONET, Joseph Cecil	Albany Med. Col.	MD 1957	200 1st St. S.W., Rochester, Minn.
IRVING, William Ralph	McGill U.	MD 1958	200 1st St. S.W., Rochester, Minn.
JOHNSON, Walter Lauren	Yale U.	MD 1955	200 1st St. S.W., Rochester, Minn.
KESTEL, John Lawrence	Creighton U.	MD 1958	Vet. Adm. Hosp., Minneapolis 17, Minn.
LACKORE, Leonard Kenneth	State U. of Iowa	MD 1958	PHS Indian Hospital, Sisseton, S. Dak.
LEHRMAN, Arthur	Albany Med. Col.	MD 1958	200 1st St. S.W., Rochester, Minn.
LEVIS, Michael Paul	St. Louis U.	MD 1958	200 1st St. S.W., Rochester, Minn.
LOBELL, Stephen M.	Columbia U.	MD 1956	200 1st St. S.W., Rochester, Minn.
MAGID, Gail Avrum	Chicago Med. School	MD 1958	200 1st St. S.W., Rochester, Minn.
MANNO, Nicholas John	Loyola U.	MD 1958	200 1st St. S.W., Rochester, Minn.
McFEE, Arthur Storer	Harvard U.	MD 1957	U. of Minn. Hospitals, Minneapolis 14, Minn.
MORAL, Harvey Morton	Albany Med. Col.	MD 1952	2215 Plymouth Ave. N., Mpls. 11, Minn.
NOLAN, Alfred Clark	McGill U.	MD 1958	200 1st St. S.W., Rochester, Minn.
PECK, Donald Alan	New York Med. Col.	MD 1956	200 1st St. S.W., Rochester, Minn.
PERRY, Richard Edgar	Hahnemann Med. Col.	MD 1955	200 1st St. S.W., Rochester, Minn.
ROUS, Stephen Norman	New York Med. Col.	MD 1956	Philadelphia Gen. Hosp., Philadelphia, Pa.
SALAMONE, Charles Raymond	Marquette U.	MD 1958	200 1st St. S.W., Rochester, Minn.
SEDLACK, Richard Earl	Northwestern U.	MD 1956	200 1st St. S.W., Rochester, Minn.
STANLEY, Paul Robert	Northwestern	MD 1958	200 1st St. S.W., Rochester, Minn.
STRIEBEL, James Louis	St. Louis U.	MD 1958	200 1st St. S.W., Rochester, Minn.
TARNAY, Thomas Joseph	Columbia U.	MD 1956	U. of Minn. Hospitals, Minneapolis 14, Minn.

The annual business meeting in the Cloud Room, presided over by Mrs. Fellows, was attended by 100 members.

Mrs. Gastineau gave a brief address, commending the Auxiliary members for their work in furthering medical careers. She said $200,000 had been given by the auxiliaries for loans and scholarships through the AMEF. Auxiliaries all over the country are increasing in membership, she said. The national president said that the major part of the annual program of auxiliaries should be the legislative program. She urged members to back the eight-point program in legislation being supported by the American Medical Association. Health legislation and the preserving of present standards is the most urgent business of the AMA, she said.

Elections Held

Mrs. Walter P. Gardner, St. Paul, is the 1960-61 President; Mrs. W. A. Merritt, Rochester, President-Elect; Mrs. M. I. Hauge, Clarkfield, First Vice President; Mrs. Karl Anderson, Minneapolis, Second Vice President; Mrs. H. M. Carryer, Rochester, Third Vice President; Mrs. M. M. Howell, Glencoe, Recording Secretary; Mrs. Wallace Gleason, St. Paul, Corresponding Secretary; Mrs. Elmer Hill, Minneapolis, Treasurer; Mrs. Karl Johnson, Duluth, Auditor; Mrs. Charles Waas, St. Paul, Historian; and Mrs. M. F. Fellows, Duluth, Parliamentarian.

Officers had been elected at the business meeting prior to the luncheon. They were installed by Mrs. A. J. Bianco of Duluth, a past president. Mrs. Bianco in officiating, admonished the new officers to "bear in mind that the main objective of this organization is to direct public thinking and actions in channels the medical profession desires and to extend authentic information on health."

About 175 women attended the luncheon, which was presided over by Mrs. M. F. Fellows, Duluth, retiring President, and attended by several special guests, including Mrs. Frank Gastineau and Mrs. Rolf Charlston, Oak Park, Illinois, daughter of Dr. Clarence Jacobson, Chisholm, President of the Minnesota State Medical Association.

Mrs. Gardner made a brief speech of acceptance of her office and Mrs. H. F. Polley, convention co-chairman with Mrs. D. C. Dahlin, introduced the guest speaker, Mrs. Lynn Pontious, of Minneapolis.

Past presidents honored at the luncheon were Mrs. M. A. Nordland, Minneapolis; Mrs. J. F. Norman, Crookston; Mrs. F. S. McKinney, Minneapolis; Mrs. Charles Waas, St. Paul; Mrs. C. L. Oppegaard, Crookston; Mrs. Reuben Erickson, Minneapolis; Mrs. H. E. Bakkila, Mrs. F. J. Elias and Mrs. P. S. Rudie, Duluth; and Mrs. Hammes.

The Auxiliary members concluded their thirty-eighth annual meeting when they attended a coffee at the home of Mrs. Polley with Mrs. Dahlin as co-hostess. Tuesday evening, they joined their husbands at the annual banquet of the medical group in the Kahler Hotel.

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In Memoriam

ROBERT M. BURNS

Dr. Robert M. Burns, a practicing physician in St. Paul for more than fifty years, died in St. Joseph's Hospital, June 6, 1960. He was eighty-one years of age at the time of his death.

Doctor Burns had served on the staffs of most St. Paul hospitals through the past fifty years.

He was born in Danville, Wisconsin, and was graduated from the University of Minnesota Medical School in 1906. He served his internship at St. Luke's Hospital in St. Paul.

In the early years of his medical career, he practiced with two well-known men, the late Dr. C. E. Riggs and Dr. C. R. Ball, in psychiatry and ailments of the nervous system. Later he joined the Earl Clinic where he was associated for many years.

Doctor Burns was a past president of the Ramsey County Medical Society and a life member of the Minnesota State Medical Association. He also belonged to the American Medical Association, the Lion's Club, and the Knights of Columbus.

He is survived by his wife, Mary; a son, Robert M.; a daughter, Mrs. Helen M. Barron; a brother, John A. Burns, all of St. Paul, and seven grandchildren.

NORMAN E. FIDELMAN

Doctor Norman E. Fidelman, Foley physician, died April 22, 1960, at the age of thirty-five.

Born in Minneapolis, Doctor Fidelman was a 1947 graduate of the University of Minnesota Medical School. He had practiced in Foley for twelve years.

Doctor Fidelman was a member of the Stearns-Benton County Medical Society, the Tri-County Medical Association, the Minnesota State Medical Association and the American Medical Association. In addition he belonged to the Phi Delta Epsilon Medical Fraternity and was president of the Central Minnesota Chapter of the American Academy of General Practice.

He was a staff member of the St. Cloud Hospital and also was a member of B'nai B'rith, Tifereth B'nai Jacob synagogue and United Hebrew Brotherhood.

Doctor Fidelman formerly served with occupation forces in Europe as a captain in the army medical corps.

Survivors include his wife, Marian; three sons, Robert Allen, David Michael and Joseph Aaron; a daughter, Marilyn; his father, Louis Fidelman, Minneapolis; and two sisters, Mrs. Molly Ackerman and Mrs. Frieda Berezovsky, both of Minneapolis.

(Continued on Page A-58)

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Coolidge, C. W.; Glisson, C. S., and Smith, A. S.: J.M.A. Georgia 48:167, 1959.

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(Continued from Page A-56)

ELMER J. LILLEHEI

Dr. Elmer J. Lillehei, Robbinsdale physician for thirty-four years, died May 14, 1960. Doctor Lillehei was sixty-five years of age at the time of his death.

Doctor Lillehei was born in Sioux City, Iowa, and was graduated from the University of Minnesota Medical School in 1925.

He was a member of the medical fraternity, Psi Chapter of Alpha Kappa Kappa, past master of Compass Masonic Lodge Number 265 of Robbinsdale and a past patron of the Eastern Star. Doctor Lillehei also belonged to the Minnesota Pathologic Society, the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. He was a veteran of World War I and a member of the Westphal American Legion Post.

Doctor Lillehei is surived by his wife, Ann; a daughter, Mrs. Donald (JoAnn) Wold, Brooklyn Park; a son, Roger, Brooklyn Park; his mother, Mrs. Paluda Larson, Minneapolis, and a brother, Dr. Clarence I. Lillehei, Minneapolis.

JAMES H. McCLANAHAN

Doctor James H. McClanahan, White Bear Lake physician, died April 14, 1960, at the age of seventy-seven.

He was born in Kirkwood, Illinois, and was graduated from Northwestern Medical School in 1909. Practicing in Ely, Minnesota, for three years, he came to White Bear Lake in 1913, where he became a staff member of St. Johns Hospital. He retired from active practice in 1951.

He was a member of the Ramsey County Medical Society, a life member of the Minnesota State Medical Association and the American Medical Association. In addition he was a member of the Lions Club of White Bear Lake.

Survivors include two daughters, Mrs. Burton Wheatlake, Denver, Colorado; and Mrs. John Hager, Ormond Beach, Florida; a son, Richards of Worthington, Ohio; a sister, Miss Helen McClanahan, Knoxville, Illinois; and two brothers, Dr. T. Scott McClanahan, White Bear Lake, and Ralph, Monmouth, Illinois.

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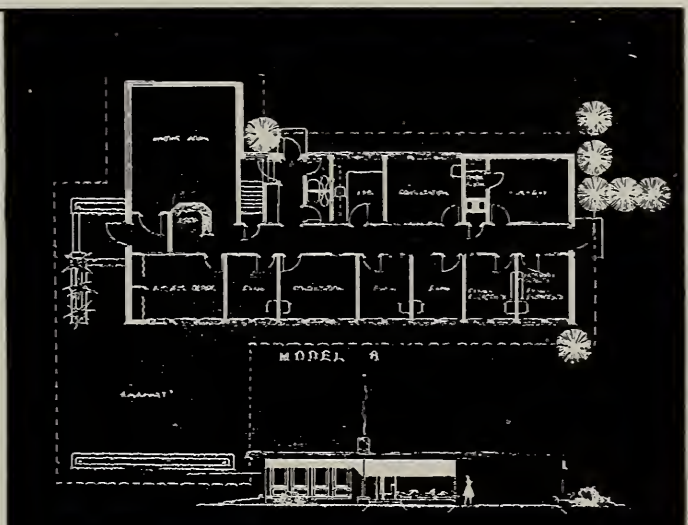
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The Physician's Diary

The Board of Directors of the Minnesota Alumni Association has presented to **Dr. Lillian L. Nye**, St. Paul, an award in recognition of fifty years of loyalty to the University of Minnesota. The title of Graduate Emeritus was bestowed upon Doctor Nye.

* * *

By an invitation from Governor Orville Freeman, **Dr. G. N. Getman, Luverne,** attended two conferences on children and youth. Doctor Getman was also invited to participate in the first statewide Governor's Conference on Rehabilitation.

* * *

Dr. A. O. Swenson, Duluth, was guest speaker at the Annual Past Master's Night Program sponsored by Euclid Masonic Lodge in the Euclid Temple. Doctor Swenson is a past master of the Euclid Lodge.

* * *

Mayo Clinic staff member, **Dr. George B. Logan**, was in charge of a forum on health, fitness and safety of youth at Governor Freeman's 1960 Biennial Governor's Conference on Children and Youth. Also attending the Conference was **Dr. John S. Pearson.** Doctors Pearson and Logan were delegates to the 1960 President's Conference held April 1 and 2, in Washington, D. C.

* * *

Crookston physician, **Dr. D. A. Peterson**, presided over the meeting of the Minnesota Academy of Foot Surgeons. **Dr. John L. Falls**, Red Wing, spoke on the Forand Bill.

* * *

Some forty physicians from Minnesota, Iowa, and Wisconsin met recently in Rochester for an organizational meeting of the Upper Midwest Allergy Society. Among fifteen papers presented at the meeting were those by **Dr. Kinsey Simonton** and **Dr. G. A. Peters** of the Mayo Clinic. A tour of the Mayo Clinic followed. Physicians making arrangements for the meeting were **Doctors L. L. Henderson, G. A. Peters, Giles A. Koelsche, Haddon Carryer, L. E. Prickman** and **George B. Logan.**

* * *

Dr. Eugene Kuz, formerly of St. Paul, is now associated in a partnership practice with **Dr. B. G. Pearson** of Shakopee. Doctor Kuz previously was in private practice of obstetrics and gynecology with the late **Dr. James S. McCabe.**

* * *

"People Speak in Many Ways" was the title of the talk given by **Dr. Paul Wilson**, Director of the Olmsted County Mental Health Clinic, at the opening session of an Institute on Communications in Public Health at the University of Minnesota Center for Continuation Study.

* * *

Dr. Edward A. Banner, Mayo Clinic, has taken over as President of the Minnesota Obstetrical and Gynecological Society at its Annual Meeting in Rochester. Other officers include **Dr. Charles H. McKenzie**, Vice President and **Dr. Alex Barno**, Secretary-Treasurer, both of Minneapolis.

Mayo Clinic staff member, **Dr. Waltman Walters**, has been elected a corresponding member of the German Surgical Society. The election took place at a recent meeting of the organization in Munich, according to information received from Dr. Willi Felix, of Berlin, President of the Society. The election of Doctor Walters to corresponding membership was unanimous.

* * *

Dr. Charles Mayo, Rochester, as a member of the Board of Directors of Mutual of Omaha, announced that the insurance company will erect a model nursing home in Washington, D. C., which will be used to try and solve the health problems of the aged.

* * *

The subject of the Shakopee Profile, a feature in the **Shakopee Valley News**, was the life of **Dr. B. F. Pearson.** The feature began with Doctor Pearson's decision as a small boy to become a medical doctor and followed through his many activities today.

* * *

Over 900 residents of Grant county and the surrounding area gather together to honor **Drs. Lester R. and Lillian B. Parson** for their thirty-six years of tireless service. The program was a complete surprise to Doctor Lester because of the close cooperation of his wife, Dr. Lillian Parson with the program planning committee. Mrs. Parson, who thought the program was entirely for her husband, was in turn surprised when the sign on the stage was changed from "Dr." to "Drs.", and she was informed that she was also being honored.

* * *

Two Minnesota physicians will play leading roles at the Third Congress of International Federation of Physical Medicine Meeting in Washington, D. C., August 21-26. **Dr. Frederic J. Kotke**, Professor and Head of the Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School, is president of the American Congress of Physical Medicine, Host Organization for the Third International Congress. **Dr. Frank H. Krusen**, Director of Physical Medicine and Rehabilitation at Mayo Clinic, is President of the Third International Congress. Bernard M. Baruch, financier and adviser to several United States Presidents, will speak at the Congress.

* * *

Dr. Thomas G. Murn has been named to replace **Dr. Edward LaFond**, both of St. Cloud, as city physician. Doctor Murn has been deputy health officer, assisting the city physician since January.

* * *

The medical assistance bills for the aged now before Congress are out-and-out vote getting measures, **Dr. Laurence D. Hilger** told the Midway Lions Club Luncheon Meeting in May. Doctor Hilger spoke as a representative of the Ramsey County Medical Society.

(Continued on Page A-62)



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(Continued from Page A-60)

Dr. John M. Burns, who has just completed a resi dent fellowship at the University of Minnesota, joinec the Oliver Clinic in Graceville the first of this month Doctor Burns will replace **Dr. C. J. Swendseen** whc has moved to the east coast.

* * *

Minneapolis physician, **Dr. Leonard Arling,** has beer elected Secretary of the Industrial Medical Associatior at the group's Annual Meeting in Rochester, New York The association was one of five industrial health groups which sponsored the national Industrial Health Confer ence. Over 3,000 health officials attended the confer ence.

* * *

Dr. Eugene A. Trudeau, formerly of Langdon, North Dakota, is now associated in the practice of medicine with **Dr. Peter Foderick,** Hallock, Minnesota. Doctor Trudeau is a graduate of the University of Manitoba.

* * *

Lakefield physician, **Dr. F. H. Koenecke,** has taker an indefinite leave of absence from his practice while he attends Postgraduate courses at the University o Minnesota. Doctor Koenecke also completed a two weeks active duty training cruise in the Navy in June

* * *

Memorials in honor of the late **Dr. Norman E. Fidelman,** Foley physician, have been sent to the Tifereth B'nai Jacob Synagogue in Minneapolis. Research into diseases of the heart and circulation will be aided by memorial funds honoring the doctor, which were ac knowledged by the Minnesota Heart Association.

* * *

Dr. Robert Vernier, Brooklyn Center, and his family will sail August 13, on the *S. S. Statendan* to live in Copenhagen, Denmark, for one year. Doctor Vernier will be speaking in Paris, Basel and Geneva and ha been invited to go to Israel. He has been granted a five-year research grant from the American Heart Association and has also been granted a Guggenheim Fellowship.

* * *

A member of the East Range Clinic of Eveleth, **Dr F. R. Kotchevar,** is one of the members of the National Foundation Chapter Medical Advisory Committees from three midwestern states who attended the Chicago Conference sponsored by the National Foundation.

* * *

Dr. Deane A. Skyberg, East Grand Forks, has beer re-elected President of the East Grand Forks Junio Chamber of Commerce. The group was just organized at the beginning of the year.

* * *

Mayo Clinic staff member, **Dr. O. H. Beahrs,** ha been elected as President of the Minnesota Surgical Society at the Annual Meeting of the organization in Rochester. **Dr. David P. Anderson,** Austin, was named President-Elect. Other officers include **Dr. William A Black,** New Ulm, Vice President; **Dr. Josiah Fuller,** Duluth, Secretary-Treasurer; **Dr. Louis C. Lick,** St. Paul **Dr. R. Wynn Kearney,** Mankato, **Dr. Stuart W. Arhel**

ger, Minneapolis, **Dr. Frederick M. Owens, Jr.**, St. Paul, and **Dr. Malcolm G. Gillespie**, Duluth, were elected as Directors.

* * *

Halstad area residents were happy to learn that **Dr. Glenn Brown**, a native of Halstad, returned to take over the practice left vacant by the death of **Dr. Eskil Erickson**. Doctor Brown left a practice in Bottineau, North Dakota.

* * *

Dr. H. B. Burchell, Mayo Clinic, was injured slightly in a highway accident near Cannon Falls. Doctor Burchell suffered cuts and bruises but did not require hospitalization.

* * *

The medical staff of the Charles T. Miller Hospital, St. Paul, has announced the election of officers that were effective July 1. Elected were **Dr. Frank J. Milnar**, President, to succeed **Dr. Norbert J. Lilleberg**; **Drs. C. Naumann McCloud, Jr.**, First Vice President; **Charles W. Froats**, Second Vice President; **William H. Hollinshead**, Chairman, Medical Services; **Milton M. Hurwitz**, Chairman, Administrative Services and **Lyle A. Tongen**, Chairman, Education and Research.

* * *

Dr. William Kozel, formerly of St. Paul, joined the staff of the Morris Medical Center July 1. Doctor Kozel was previously on the staff of the St. Joseph Hospital in St. Paul.

* * *

The American Board of Obstetrics has certified **Dr. Hershel B. Cope**, of the Lenont-Peterson Clinic in Virginia.

* * *

St. Paul physician, **Dr. Lillian Nye**, left June 24, for Rhinelander, Wisconsin, where she will spend the summer at Bryn Afon Camp as medical director.

* * *

Three Mayo Clinic staff members were speakers at the 56th Annual Meeting of the National Tuberculosis Association held in May at the Statler-Hilton Hotel in Los Angeles. The speakers were **Drs. David T. Carr, John G. Mayne**, and **Alfred G. Karlson.** Doctors Carr and Karlson are on the Minnesota TB and Health Association Board. **Dr. Abraham Falk**, Minneapolis, was also a speaker at the meeting.

* * *

Dr. Edward J. Baldes, Mayo Clinic, was a guest of the Committee on Science and Astronautics of the U. S. House of Representatives at a meeting of prominent scientists and engineers in Washington, D. C., June 2 and 3. Doctor Baldes was a member of the Committee's panel on Science and Technology, appointed by Chairman Overton Brooks to explore various ways in which the scientific and technologic progress of the country may best be fostered.

* * *

Drs. William L. Benedict and **O. Erik Hallberg**, Mayo Clinic staff members, were guests of the Pennsylvania-New Jersey Academies of Ophthalmology and Otolaryngology in Atlantic City, New Jersey.

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Dr. Henry W. Meyerding, emeritus Mayo Clinic member, opened the Twelfth Biennial International Congress of the International College of Surgeons in Rome, Italy. Doctor Meyerding is president of the International College of Surgeons.

* * *

Winona has a new health officer. He is **Dr. Warren W. Haesly,** who succeeded **Dr. R. H. Wilson,** who became ineligible to continue in the office when he moved outside the city limits last month.

* * *

Dr. Theodore H. Lester, formerly of Willmar, and now serving with the Medical Corps in Nürnberg, Germany, will open a practice in the new medical building in Browns Valley. Doctor Lester is expected to begin his practice sometime in September.

* * *

Gaylord physician, **Dr. Arlen J. Sneltjes,** has announced plans to practice in Henderson two days each week.

* * *

Dr. M. B. Gaebe, Clara City, has announced that **Dr. Lyle Munneke** of Duluth will enter practice at the Clara City Medical Center with him. Doctor Munneke will begin his practice at the Medical Center on August 1.

* * *

The Northern Association for Medical Education has set a goal of $28,000. The announcement came from **Dr. Jane E. Hodgson,** Chairman of the Finance Committee of the Association.

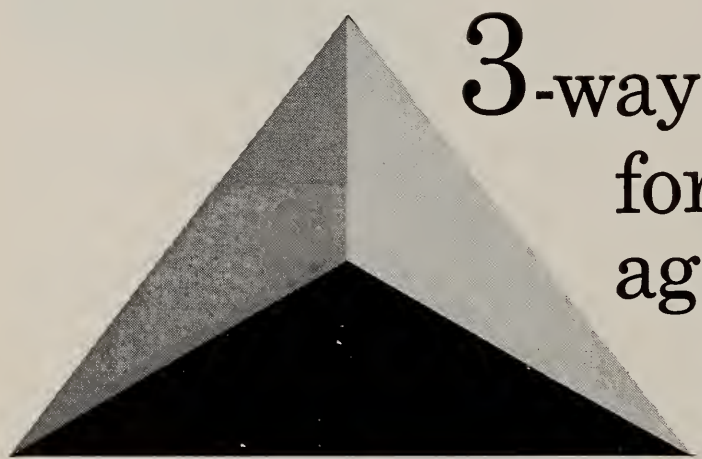
Book Reviews

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

ORTHOPEDIC SURGERY IN THE MEDITERRANEAN THEATER OF OPERATIONS. By Oscar P. Hampton, Jr., M.D., F.A.C.S., Colonel, MC, USAR. (U. S. Army. Surgeon General's Office. The Medical Department of the U. S. Army in World War II) 368 pages. Illus. Washington, D. C.: Government Printing Office, 1957. Price, $4.00.

Every orthopedic surgeon will profit from the study of this excellent volume depicting the experiences had in dealing with fractures in World War II. Of particular value is the discussion of the treatment of massive compound fractures and the use of internal fixation in the face of compounding of fractures. Injuries of the joints are very capably discussed and well illustrated. The volume is profusely illustrated with excellent reproductions of x-rays, well selected photographs and illustrative drawings. No better hand volume can be recommended for the surgeon who deals with trauma.

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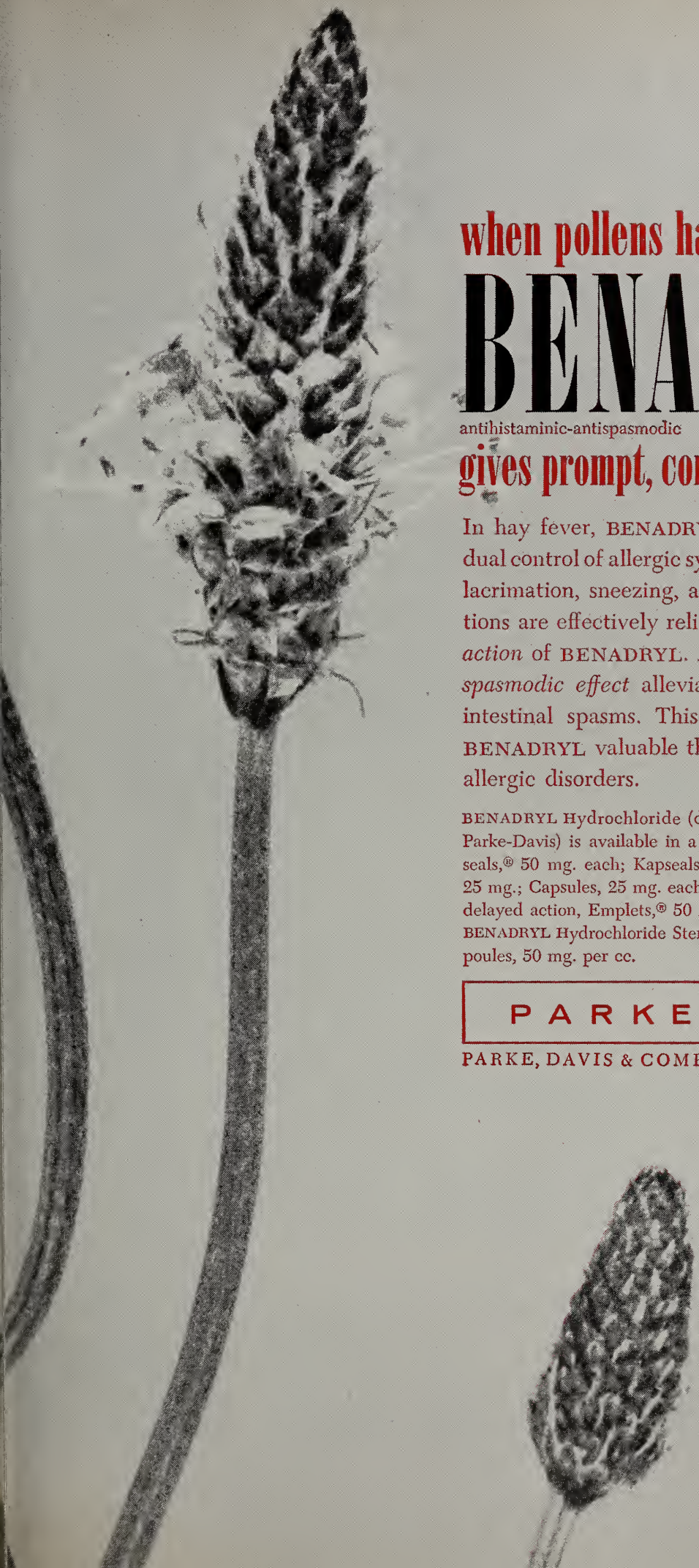
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Hypnosis in Surgical States

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HYPNOSIS is among the oldest of the medical arts and traces its origin to the times of the ancient Greeks. Indeed, the priest-physicians in the temples of Aesculapius practiced what is closely akin to modern hypnotherapy. Since then, it has enjoyed sporadic bursts of popularity only to fall back into disrepute as exaggerated claims by charlatans were disproved. In the eyes of many, hypnosis is synonomous with the antics of the stage performer. In spite of this, it is currently enjoying a rebirth, and it is the purpose of this paper to examine critically the results of hypnotherapy in 260 patients treated over the past three and one-half years in a variety of surgical states.

Methods and Results

Hypnoanesthesia for Proctoscopy.—Proctoscopy is in too many patients a source of embarrassment and pain, owing chiefly to ignorance and superstition. Yet, it remains a standard technique in diagnosis and examination of the rectum and lower bowel and is the *sine qua non* in the early diagnosis of rectal cancer. Thus it is within the physician's province to provide a suitable means of allaying the fears of the layman regarding this important adjunct. Hypnosis has proved a most worthy and acceptable tool.

To date, seventy-two patients have received the benefit of hypnoanesthesia for proctoscopy. Fifty-seven of this group had undergone previous proctoscopy and considered it to have been a painful experience, while the remaining fifteen patients were experiencing the procedure for the first time. Our method has been to induce the hypnotic state prior to examination and to make suggestions relative to the ease and painlessness of the procedure, and to instill in the patient a spirit of cooperation. The patient is then awakened and the examination is made immediately. The results are shown in Table I.

TABLE I. HYPNOANESTHESIA FOR PROCTOSCOPY

Results	Previous Experience		No Previous Experience	
	Number of Patients	Per Cent	Number of Patients	Per Cent
Excellent	37	64.9	10	66.7
Good	12	20.1	2	13.3
Fair	4	7.0	1	6.7
Poor	4	7.0	2	13.3
Total	57	100.0	15	100.0

All evaluations were based on comments made by the proctologist and nurse in attendance and by the patients themselves. For a patient to be classified as an excellent result, the patient had to report little or no discomfort or pain during the examination, and the proctologist and nurse made a notation of the excellence of the patient's behavior, as well as the adequacy of the examination. A good result indicates an adequate examination with only slight discomfort to the patient, while a fair result implies a less satisfactory ex-

amination with moderate discomfort. A poor result indicates an unsatisfactory examination, with considerable pain and aggravation displayed by the patient. It was felt that by selecting patients who already had some experience with

TABLE II. CONTROL OF POSTOPERATIVE PAIN BY HYPNOSIS

Comparison of Narcotic Doses

	Group I*	Group II**	Total	Control Group (Not Hypnotized)
Number of patients	68	17	85	78
Total doses of narcotics during convalescence	308	55	363	538
Average number of doses during convalescence	4.51	3.24	4.21	6.89
Range of doses	0-29	0-14	0-29	0-44

*Hypnotherapy eight to twenty-four hours prior to surgery.
**Hypnotherapy during induction of anesthesia immediately prior to surgery.

the procedure, there was established a standard of comparison. In addition, no patient with previous experience was considered a good or excellent result if he felt that hypnosis was ineffective in reducing the discomfort experienced on prior examinations. Among this group were several patients who earlier had received narcotics, as well as one patient in whom general anesthesia was necessary for a previous proctoscopic examination. Such measures were obviated completely by the use of hypnosis, and in the two groups, 80 per cent experienced a good or excellent result attending induction of the hypnotic state immediately prior to performance of the examination.

D. C., an eighteen-year-old girl with a four-year history of severe recurrent bloody diarrhea, had undergone proctoscopy on two previous occasions. These examinations had been attended with such pain and displays of emotion by the patient that it had been necessary to terminate the procedure and administer narcotics. When first seen on this admission, this same patient refused to permit a rectal examination to be done. Because of the necessity of establishing a diagnosis, it was decided that a repeat proctoscopy should be done. Immediately prior to this examination, the patient was placed in the hypnotic state and then a satisfactory proctoscopy was carried out without any pain or emotional display by the patient. No narcotics were required. A diagnosis of chronic ulcerative colitis was made and subsequently a total colectomy, proctectomy, and ileostomy were performed.

Postoperative Pain.—In spite of the tremendous advances in surgery, pitifully little has been done to make the memory of operation more pleasant for the patient. Witness the fear and anxiety with which the patient greets the news that he must have surgery. In spite of the high degree of safety, the layman has not changed his attitude regarding the surgeon and operation. Thus, it is our feeling that hypnosis has a very definite place in the control of postoperative pain.

We have pre-treated eighty-five patients who were about to undergo major abdominal and thoracic surgery by hypnotic suggestion, in an effort to allay the anticipated discomfort of the postoperative period. Members in this group have been treated in one of two ways: In the first group of sixty-eight patients (Table II), hypnotherapy was given the day prior to operation, and suggestions imparted relating to tolerance of indwelling nasal tubes and urinary catheters and the acceptance of intravenously-administered fluids, suggesting to each patient that none of these will occasion distress. It is also suggested to these patients that the area of incision will cause no discomfort; an attempt also is made to instill in the patient a sense of confidence in the success of the procedure and a spirit of cooperation with members of the nursing and surgical staff. Finally, all patients are told that analgesics are available and will not be withheld when needed. In the second group of seventeen patients (Table II), hypnotherapy was given on the operating table just prior to and during the anesthesia-induction period. The same suggestions were made to both groups of patients. The observed results are recorded in Table II in which the narcotic requirements of the treated groups are compared; a group of untreated controls selected at random, undergoing similar operations, also was employed for purpose of comparison.

While it is difficult to evaluate the benefits derived by the treated group due to the subjective nature of pain, the reduction in the amount of narcotics required by the treated groups is obvious (38.7 per cent). It would appear that narcohypnosis may be an even more potent agent than the conventional techniques of hypnotherapy and we intend to explore this variant further. It may be that a combination of the two methods may be more effective than either alone. In addition, there appeared to be a greater buoyancy of spirit, better cooperation, and fewer complaints in the treated groups, than in the untreated group.

A better appreciation of the results may be obtained by considering that six patients under-

going cholecystectomy by the same surgeon, four treated patients received none, one, two, and four doses of narcotic after surgery, while two untreated patients received eight and eleven doses of the same agent. In addition, four patients underwent "second-look" procedures for residual carcinoma after the removal of the primary lesion and received hypnotic suggestion prior to the second procedure only. In this group, there was an average reduction of narcotics after the second operation to only 12.8 doses, as compared to 35.5 after the initial procedure.

Mrs. M. D., a fifty-two-year-old white woman, underwent a panhysterectomy and bilateral salpingo-oöphorectomy for carcinoma of the ovary in August 1958. During convalescence she required a total of forty doses of demerol. A second-look procedure was carried out in May, 1959, after previous hypnotherapy the evening before the operation. Following the second procedure, a total of only three doses of demerol was required. The patient was much more cheerful and enthusiastic; she ambulated earlier, and was generally a much more pleasant and cooperative person.

Miscellaneous Types of Pain.—Pain is one of the most frequent presenting complaints of patients. For some conditions, the physician must be content with palliation and relief of pain, foregoing the more desirable objective of elimination of the cause. Still, there is no universally effective analgesic available and there are many situations which try the soul of both patient and physician in regard to pain. Most notable among these are the conditions of metastatic cancer, phantom limb, the various neuralgias, and arthritides.

We have treated forty-six patients with hypnotherapy for various painful states and all have been followed three months or longer and have been available for evaluation. Our method of treatment in this group is to induce the hypnotic state, at which time suggestions are made relative to anticipated relief of pain. In a few instances, the patients were taught self-hypnosis, but in no patients was psychologic evaluation made. The patients were seen at weekly intervals until maximal benefit had been obtained and then reassessed periodically thereafter. Between two and ten weekly sessions were necessary to obtain good or excellent results, with an average of four. Invariably in patients who failed to secure satisfactory relief, the patient usually terminated the therapy after four to six sessions. Patients in whom good or excellent results were achieved have been followed for periods varying between three and thirty-two months (average 14.8 months) or until the time of death, as the case may be. Because of the subjective nature of pain, several criteria have been established to help determine what constitutes a good or excellent result: (1) complete elimination or marked reduction in narcotic requirements contrasted with the situation prior to therapy, (2) hypnotherapy succeeded in achieving pain relief in patients to whom chordotomy had been proposed, (3) the patient reports only minimal and no persistent symptoms, (4) relief persists until the time of death or at least three months without permanent recurrence. A fair result indicates only mild amelioration of symptoms; a poor result denotes no improvement or failure to achieve the objective. The observed results are shown in Table III.

TABLE III. MISCELLANEOUS PAIN

Type of Pain	Results			
	Excellent	Good	Fair	Poor
Metastatic CA	2	3*	4	3
Back pain	1**	—	1	2
Phantom limb	4	4	—	2
Joint pain	3	1	3	3
Neuralgia	1†	—	2	1
Unclassified pain	2	—	—	4
Total	13	8	10	15

*Cordotomy avoided in one patient.
**Prior failure of cordotomy.
†Prior failure of trigeminal rhizotomy and avoidance of glossopharyngeal rhizotomy.

In one instance, cordotomy was avoided, while in two cases hypnosis resulted in marked relief after failure of cordotomy and trigeminal rhizotomy respectively. Thus, a good or excellent result was obtained in twenty-one of forty-six patients (45.7 per cent), and in no patient was a recurrence of symptoms noted which failed to respond to further therapy. Several patients, however, experienced occasional mild exacerbation of symptoms but these were easily controlled with further therapy.

Mrs. G. G., a fifty-five-year-old white woman, underwent resection of a sphenoid ridge meningioma in 1947 following which she was partially aphasic. In 1958, she began to complain of severe facial pain and a trigeminal rhizotomy was carried out. No recurrence of the tumor was noted but no relief of pain was achieved and soon the patient began taking narcotics. The drugs gave only minimal relief, and a glosso-pharyngeal rhizotomy was proposed. However, a course of hypnotherapy prior to further surgery was decided upon. Because of the

problem of the aphasia, it was necessary to utilize narcohypnosis. Following this, the patient was seen on two subsequent occasions at which time hypnotherapy was carried out by the usual means in the absence of any drugs. Since then, the patient has eliminated the use of narcotics and operation has been avoided; she has had only minimal symptoms during a period of more than one year since hypnotherapy was used.

Postgastrectomy Syndrome.—There can be little doubt that the dumping syndrome is the most perplexing complication attending gastric resection for duodenal ulcer. It has been a common observation that patients developing this complication fit a certain personality pattern. It may well be that the operation merely serves to focus attention on the operated stomach and without it, these patients would have other equally bizarre complaints. Sooner or later the physician and surgeon are forced to admit defeat in a great proportion of these cases. We have found hypnosis useful in the treatment of this vexing problem.

Forty-one patients suffering from the postgastrectomy dumping syndrome have been treated during the past three and a half years. Only patients subjected to gastric resection longer than one year prior, were accepted for treatment. It is well known that many patients exhibit typical dumping symptoms immediately after surgery, but these disappear in a few months. All types of gastric resection are represented in this study, the Billroth II operation predominating. Our method of therapy has been to aim hypnotherapy directly at the removal of the patient's specific complaints. Sessions are held at weekly intervals until an optimal result is obtained, with periodic reappraisal therafter. Between two and twenty-one inductions were necessary to achieve an optimal result (average 5.6). The follow-up on these patients ranges from four to forty-three months, with an average of 25.2 months. Only four patients have been followed less than one year, and twelve patients have been followed over three years. The remainder (twenty-five patients), have been followed from one to three years. Objective evidence of weight gain, in addition to the patient's statement regarding the degree of relief from symptoms, was employed to characterize as good or excellent the observed results. A fair result indicates only symptomatic improvement without weight gain; a poor result suggests that neither objective was achieved. The observed results are recorded in Table IV.

TABLE IV. POSTGASTRECTOMY SYNDROME

Results	Number of Patients	Per Cent Total	Average Weight Gain (Pounds)
Excellent	16	39.0	7.8
Good	10	24.4	7.1
Fair	3	7.3	—
Poor	12*	29.3	—
Total	41	100	—

*Includes four patients who had remission after excellent symptomatic relief and weight gain for over one year.

It can be seen that good and excellent symptomatic relief and weight gain was experienced by 63.4 per cent of the group. Only four patients suffered a permanent recurrence of symptoms to the level of the initial complaint and all had more than a year's relief.

Mr. L. A., a fifty-two-year-old unmarried man, underwent gastric resection in 1955 for peptic ulcer. Since then he had been plagued with severe dumping symptoms to the extent that he was 40 pounds below his preoperative weight. Hypnotherapy was begun in November, 1956, and after eleven sessions, he was nearly completely free of symptoms. Since his first visit, he has gained 20 pounds and at the present time, almost three and a half years later, the patient continues to maintain an excellent asymptomatic state.

Obesity.—The problem of obesity has presented itself to the general physician, surgeon, and psychiatrist alike, and none have met with great success. In spite of the numerous articles in the lay press warning of the hazards of obesity, dieting is nevertheless a severe test of the body. In an effort to create a more fertile soil in which to implant the seed of caloric reduction, we have embarked on a program of combined hypnotherapy and caloric reduction.

Sixteen obese patients have been treated with hypnotherapy in an attempt to enforce dietary restriction. The method employed has been to place the patient on a strict reducing diet, encouraging the patient by suggestion to accept the dietary restrictions. When possible, the patients are seen weekly thereafter, at which time the procedure is repeated.

A glance at the results in Table V reveals that all of the sixteen patients treated discontinued therapy after varying intervals and at that point, none had even approximated an ideal weight. Further, most patients failed several appointments during therapy. These results are far from encouraging and do not augur well for the promise of hypnotherapy in the management of obesity.

Discussion

Previous reports from this clinic have documented our earlier experience with hypnotic suggestion as a mode of therapy for a number of conditions which relate to the surgeon's activity.

TABLE V. OBESITY

Case No.	Initial Weight	Weight Loss	No. of Weeks	No. of Sessions	Result	Remarks
1-7	195-239	—	—	1	Poor	Patient terminated
8	175	15	52	8	Fair	"
9	165	30	18	2	Fair	"
10	237	30	17	8	Fair	"
11	213	15	88	8	Fair	"
12	204	13	4	3	Fair	"
13	276	16	3	2	Fair	"
14	197	18	65	13	Fair	"
15	232	25	18	12	Fair	"
16	200	14	9	6	Fair	"

A comparison of the results obtained indicates certain discrepancies. Our initial studies 1-4 concerned the postgastrectomy dumping syndrome and earlier results indicated a slightly higher incidence of improvement than that reported herein. However, as this work has progressed, we have begun to treat a more unfavorable group of patients in that they have not presented characteristic symptoms of the "dumping syndrome" but a variety of bizarre complaints attributed to gastrectomy. No doubt, many of these newer patients have deeper psychologic problems with which mere symptom removal cannot cope. Nevertheless, a sufficient number of this group achieve a worthwhile result, such that we are encouraged to continue use of hypnotherapy in this latter group. It is interesting to note that less than 10 per cent of the group has had recurrence of complaints, so that it would appear that mere symptom removal can, indeed, produce long-term results.

As we have continued our efforts in the alleviation of postoperative pain by hypnosis, we are more impressed than ever that this is a worthwhile adjunct. As more experience has been gained, the narcotic reduction in the treated group has increased with the result that we are now applying this method to thoracotomy and more extended abdominal procedures than before. Especially encouraging are the results obtained in the small group undergoing "second look" procedures.

The group undergoing proctoscopy has been a most satisfying venture to all concerned, with the result that patients now request therapy, having heard of its dramatic results from a fellow patient or friends. One of our proctologists has been so impressed with the greater ease and facility of sigmoidoscopic examinations under hypnotherapy that he is adding it as a preliminary adjunct to the procedure in his private practice.

The results obtained in the group of patients suffering from a miscellany of pains are somewhat difficult to rationalize and understand. In the phantom limb group, results have been uniformly good, while in the other groups, only fair. It is especially mystifying, since in all other groups an occasional dramatic result has occurred, with avoidance of operation and discontinuance of narcotics. It may be that those suffering from the phantom limb are merely more susceptible to hypnotherapy. Be that as it may, the occasional good result obtained in patients complaining of bizarre types of pain is impressive enough to warrant continuation of hypnotherapy in the group as a whole.

Our results in the use of hypnosis as an adjunct to weight reduction continue to be discouraging. It would appear that this method has little to recommend itself. Our impression is as before, that many of these patients have unexpressed psychologic problems and obesity is merely an expression thereof.

Summary

1. The use of hypnotherapy in 260 patients in a variety of surgical states has been reviewed.

2. This method has proved to be of great value in relief of the discomforts of proctoscopy, postoperative pain, and the postgastrectomy syndrome.

3. Hypnotherapy is invaluable in relief of phantom limb pain, and has occasionally been found useful in a wide variety of other painful states.

4. Hypnotherapy has not been a successful mode of management in obesity.

References

1. Leonard, A. S., Papermaster, A. A., and Wangensteen, O. H.: Treatment of postgastrectomy dumping syndrome by hypnotic suggestion. J.A.M.A., 165:1957, 1957.
2. Doberneck, R. C., Griffen, W. O., Papermaster, A. A., Bonello, F., and Wangensteen, O. H.: Hypnosis as an adjunct to surgical therapy. Surgery, 46:299, 1959.
3. Bonello, F. J., Doberneck, R. C., Papermaster, A. A., Griffen, W. O., Jr., and Wangensteen, O. H.: Hypnosis in surgical therapy I. The postgastrectomy dumping syndrome. Am. J. Clin. Hypnosis, 2:215, 1960.
4. Papermaster, A. A., Doberneck, R. C., Bonello, F. J., Griffen, W. O., and Wangensteen, O. H.: Hypnosis in surgical therapy II. Pain. Am. J. Clin. Hypnosis, 2:220, 1960.

The Cytologic Diagnosis of Cancer

A Practical Approach for the Practicing Physician

"Every physician's office can be a cancer-detection center" is a modern apothegm that emphasizes a tremendous potential in the cure of cancer. This article dispassionately dissects the role of cytologic techniques in cancer detection, assessing their advantages and properly weighing their limitations. It covers practically every part of the body that can shed cells for the cytologist's slides. Every physician will find much gold in this hill.

IT IS my intention to discuss my philosophy regarding the use of exfoliative cytology in the diagnosis of malignant tumors in the general practice of medicine. It is not the purpose of this communication to review the hundreds of articles pertaining to exfoliative cytology of body fluids and secretions that have mushroomed during the past fifteen years, but rather to offer a summary of the methods as applied to practically every organ system of the human body and a critique of the practical application to the practice of medicine.

The diagnosis of cancer by cytologic means as opposed to the morphologic approach is not a new method in oncology. For many years, this concept has been applied successfully in the use of fresh frozen sections. It also has enjoyed rather widespread acceptance in the examination of pleural and ascitic fluid for malignant cells, with a somewhat more limited application in the use of aspiration smears as a means of tumor biopsy.

Following the scholarly and well-received work of Papanicolaou and Traut,[1] in 1943, the postwar years were seething with enthusiasm for exfoliative cytologic diagnoses. To quote Dockerty,[2] "Every conceivable body orifice was swabbed, scraped, washed, siphoned, aspirated, brushed and massaged for its maximal yield of cells, some of which might be malignant."

The rationale of exfoliative cytology is based on the desquamation of viable cancer cells from malig-

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nant tumors having a free surface. These exfoliative cells may be collected in whatever medium they lie, such as sputum, gastric washings, and vaginal secretions, stained by several methods and studied for the characteristics of malignancy.

At first glance, it would appear as if this method would be foolproof and that its application would be unlimited. Unfortunately, however, a number of restricting factors play an important role in narrowing the judicious application of the method. These include (1) the anatomic location of the lesion, (2) the presence of a free tumor surface for the exfoliation of viable cells, (3) the nature of the medium in which these cells are shed, (4) satisfactory collection and representative sampling of the exfoliated cells, and (5) interpretation of the material at hand in situations that allow histologic confirmation.

Before we embark on a discussion of specific cytologic methods, let us inquire into what we may expect to accomplish. Are we proposing a screening method for a large number of patients, or are we applying it to a selected group of patients as a diagnostic tool of a high degree of accuracy, or is it to be an adjunct to already established diagnostic methods? One should keep in mind the limitations of the cytologic methods of diagnosis and fully appreciate the significance of negative, suspicious and positive results. Probably the best approach to an evaluation of the various cytologic methods is to review the various organ systems with respect to their potential in the cytologic diagnosis of cancer.

Uterine Cervix

The most successful application of the cytologic technique has been in the detection of preclinical carcinoma of the uterine cervix. The ease with which satisfactory material for cytologic examination can be obtained and the relative accessibility of the uterine cervix to complete biopsy procedures has resulted in widespread acceptance of the cytologic method for discovering early malignant disease in this organ. In addition, the method

adapts itself readily to a screening program for large numbers of asymptomatic women.

A few simple rules should be kept in mind when one obtains cytologic material from the cervix. Since carcinoma has been observed to begin at the squamocolumnar junction in nearly 100 per cent of cases, a more nearly complete sampling of the surface epithelium by the use of a spatula to detach the surface cells of the junctional zone of the endocervix and portio is highly recommended. Care to shape this spatula so that it will fit the external os ensures more adequate sampling of the zone in question. It is imperative that the smeared material be immersed immediately in a fixative* in order to eliminate cellular distortion resulting from drying.

The literature is replete with reports on the value of cervical cytology. However, a short summary of the experience of our group at the Mayo Clinic[3,4] with this method during the past twelve years serves to emphasize its values and its limitations.

During the years 1948 through 1959, a total of 139,503 women have received a primary screening smear at the clinic. The rate of discovery of preclinical carcinoma in this group is 7.1 per 1000 women screened. These women were judged to have a normal cervix or some benign lesion of the cervix when the initial smear was taken. Of the 987 preclinical carcinomas discovered during this period, 90 (9 per cent) were infiltrating squamous cell carcinomas. It is not our policy to request cervical smears in cases of clinically suspected or diagnosed carcinoma of the cervix, as we believe that the smear should be used as a screening tool to select those cervices for biopsy which otherwise might be considered normal or to contain an inconsequential lesion.

The incidence of falsely negative results cannot be determined for obvious reasons; however, during this period, we have discovered twenty-five cervical carcinomas in patients who have undergone cervical biopsy or an operation for some reason despite a negative smear. In some instances, the significant cells in these smears have been overlooked, whereas the smears in other instances did not contain significant cells. In the latter cases, poor sampling of the junctional zone, drying of the smears prior to fixation, or the presence of excessive amounts of blood, pus, or mucus would appear to explain the failure of smears. Between 1200 and 1500 cervical biopsies and 800 to 900 hysterectomies for various unrelated conditions are done each year at the clinic on patients who have had negative smears. These elective procedures tend to act as a limited check on our negative results.

The optimal period for obtaining repeat cervical smears cannot be stated categorically, although we arbitrarily have recommended a one-year interval between negative smears. During a six-year period, 17,760 women have had one repeat smear examined in our laboratory. In this group, thirty-nine preclinical carcinomas have been found, thus establishing a detection rate of 2.1 per 1000 women rescreened, a rate substantially below that in the initial screening smears. This reduced rate in repeat smears apparently indicates that the epithelial changes being detected are significant, for if these changes were unimportant the detection rate should be similar in both groups.

During the six-year period, 209 falsely suspicious smears were observed and investigated. Study of the biopsy material in these patients showed that 68 per cent of them exhibited some degree of basal cell hyperplasia or dysplasia of the cervical epithelium. Because of the frequent association of dysplasia or epithelial atypy with *in situ* squamous cell carcinoma at the junctional zone, we believe that one is duty bound to request a biopsy when only dysplastic changes are suggested from the cells found in the cervical smear.

From past experience, it has been learned that quadrant biopsy of the junctional zone of the cervix will yield the source of the cells found in the smear in approximately 85 per cent of cases. In more recent years, the pathologists at the clinic have prevailed on the surgeons to perform cold-knife conizing biopsy in order that we may study more thoroughly the junctional zone and at the same time render an opinion on the fresh frozen tissue as to whether carcinoma *in situ* is present, whether there is infiltration of the underlying stroma, or whether the cells found in the smear represent dysplastic changes that do not substantiate the diagnosis of carcinoma. In our opinion, conizing biopsy solves all three of the foregoing problems with a degree of finality that cannot be achieved with punch biopsy.

In selected cases, cutting out a cervical cone is used as a therapeutic as well as a diagnostic tool.

*Use of 95 per cent ethanol has proved to be satisfactory in our experience.

In general, however, treatment for *in situ* carcinoma of the cervix has been vaginal hysterectomy after cold-knife conization and frozen-section diagnosis. If one elects to use punch biopsy, it is imperative that cautery not be used and that hemostasis be obtained by the use of gelfoam and a vaginal pack until such time as the tissue diagnosis has been established. Our past experience has led us to believe that many unsolved instances of atypical or positive cells in the cervical smears have been the direct result of unsatisfactory punch-biopsy material and the injudicious use of the cautery at the time of biopsy.

A number of investigators recently have reported on use of cervical smears as a means of detecting invasive cervical carcinoma as opposed to *in situ* carcinoma. The presence of clinically detectable carcinoma of the cervix usually can be suspected in smears by certain nonspecific findings; however, we believe that these findings are far too variable and speculative to replace tissue diagnosis. In fact, information derived from such a method may be dangerous in that it may mislead the clinician and result in mismanagement of a patient.

Endometrium

The cytodetection of endometrial carcinoma has not been as satisfactory as has that of lesions of the uterine cervix. The detection rate in the hands of many investigators has averaged a little more than 50 per cent, which reflects the difficulty in consistently obtaining representative cytologic material from the endometrium in the vaginal pool. Aspiration of the endocervical canal and endometrial cavity offers the most satisfactory solution to this problem. However, both of these methods are cumbersome and time-consuming. In our experience, aspiration of the endocervical canal has not been rewarding. Many screening programs utilize the vaginal pool in addition to cervical scrapings for cytologic study in the hope of detecting early endometrial carcinoma. In our opinion, the chances of finding an early, completely asymptomatic endometrial carcinoma are so remote that we have preferred to concentrate our efforts on the discovery of preclinical carcinoma of the cervix.

Ullery and associates[5] reported a comparative study on 5260 women in whom cervical scrapings and smears from the vaginal pool were made at the same time in an effort to evaluate the comparative error. In this group, eleven carcinomas of the cervix were missed by use of the vaginal-pool smear.

Smears made after endometrial aspiration have been of value in the hands of some gynecologic surgeons who do not elect to subject their patients to preliminary curettage prior to abdominal operations. In a group of 901 patients with abnormal uterine bleeding, Hecht[6] found an incidence of endometrial carcinoma of 6 per cent; 58 per cent of these patients had positive vaginal-pool smears and 92 per cent had positive endometrial-aspiration smears. Four falsely negative results and five falsely positive results were encountered in the aspiration smears. In our opinion, abnormal uterine bleeding is best investigated by curettage and histologic study of the removed tissue.

The diagnosis of intra-abdominal carcinoma by use of vaginal smears occasionally is reported. We have found malignant cells from ovarian carcinoma and gastric carcinoma in smears and have recognized them as being from adenocarcinomas. Such cases are only of incidental interest and we attach little practical value to these findings in that a history and careful physical examination always have revealed findings of abdominal carcinoma.

Respiratory Tract

The diagnosis of bronchogenic carcinoma by cytologic examination of sputum or bronchial secretions has proved to be a valuable adjunct to diagnosis in persons suspected of harboring a pulmonary neoplasm.

At the clinic, it is customary in these studies to collect morning sputum in 95 per cent ethanol. The patients are instructed to collect only sputum from a productive cough and to avoid nasopharyngeal secretions. Five smears are prepared from each specimen by technicians trained in the selection of material from sputum. Three specimens are examined on consecutive days before an adequate negative cytologic examination has been considered to have been done.

In a study of 588 cases of miscellaneous thoracic diseases by Woolner and McDonald,[7] 147 cases of proved or suspected bronchogenic carcinoma were found, and 100 (68 per cent) of these were detected by cytologic examination of sputum or bronchial secretions. In a group of ninety-three patients, positive tissue diagnosis by bronchoscopic examination was obtained in 41 per cent. Recently, Umiker[8] reported a 69 per cent incidence of

sputum that gave suspicious or positive results for malignant cells in such cases.

The highest incidence of positive results was found in cases in which lesions were in the main-stem bronchi or in the lower lobes. Use of bronchial washings increased the accuracy of the bronchoscopic examination in upper-lobe lesions from 22 to 38 per cent.

The problem of occult carcinoma of the bronchus recently has been reviewed by Woolner and associates,[9] who reported fifteen cases encountered at the clinic during a thirteen-year period. These lesions were considered occult because minimal or no tumor was visible on gross examination of the surgical specimens. All patients with invasion beyond the bronchial wall were excluded, and all patients exhibited an extensive *in situ* component. Cytologic diagnosis played a prominent part in eleven cases, thus bringing the patients to operation early and presumably in a curable stage. One of these patients had positive cytologic results for three years prior to the development of bronchoscopic and roentgenologic findings. Bronchoscopic biopsy gave positive results in 47 per cent of these fifteen cases. A number of the patients who have had some form of pulmonary resection for carcinoma have been reported to demonstrate an *in situ* carcinoma in the opposite lung or in the bronchial stump at some time after resection. Cytologic studies of sputum after pulmonary resection for carcinoma would appear to be of value as a follow-up procedure.

Pulmonary cytology is basically an accessory laboratory diagnostic tool and not a screening tool for asymptomatic persons. Selectivity usually is based on abnormal roentgenograms of the thorax or a history of repeated pneumonitis or cough. Some success has been achieved with the aid of aerosol techniques in producing sputum in asymptomatic persons or in those unable to produce sputum despite roentgenologic evidence of a lesion. The rate of falsely positive results in pulmonary cytology is approximately 1 per cent. The exfoliated epithelium from lungs containing infarcts, organizing pneumonia, asthma, or bronchiectasis may originate from atypical squamous metaplasia associated with these conditions, and, therefore, be responsible for falsely positive or suspicious cells in the smear. The location of a lesion in the lung is of prime importance in the exfoliation of malignant cells. Recently, Woolner[10] demonstrated that peripheral lesions exfoliate cells into bronchial secretions or sputum at something less than half the rate in those lesions found in the main-stem bronchi. Cytologic studies also have proved to give a fairly accurate interpretation of the histologic type of carcinoma that may be expected in the resected lesion.

Pleural and Ascitic Fluid

For more than fifty years, physicians have been utilizing cytologic study of effusions as a means of establishing a diagnosis of malignant disease.

The smear technique and the paraffin-block method of examination of centrifuged sediment from an effusion tend to complement one another, but both methods may lead to falsely negative and falsely positive results. My associates and I[11,12] recently analyzed critically the data obtained from a battery of tests made on ascitic fluid from 132 patients in an attempt to obtain more reliable diagnostic information from the fluid. This group included sixty-nine patients with proved malignant tumors, forty-six with cirrhosis, nine with congestive heart failure and eight with miscellaneous conditions. A total of thirty-six (52 per cent) of the fluids caused by proved malignant tumors contained malignant cells. Two of the patients with cirrhosis were falsely judged to be shedding malignant cells in the ascitic fluid. These two observations serve to point out that extreme care must be exercised in evaluating cytologic studies of effusions. Leuallen and Carr[13] studied pleural fluids from 426 patients. They were able to detect malignant cells in 59 per cent of the patients with effusion and bronchogenic carcinoma, and in 54 per cent of the patients with carcinoma of the breast with effusion. Only 13 per cent of the fluids associated with malignant lymphoma or leukemia and effusion contained malignant cells. Half of the cases in which more than one specimen of fluid was examined cytologically revealed malignant cells in only one of the specimens.

When examining pleural or abdominal fluid for malignant cells, one must remember that the formation of fluid may not be caused by serosal irritation from malignant seeding but from lymphatic blockage or a nonspecific inflammatory process. Thus, the interpretation of cells in effusions is subject to considerable error.

Evaluation of the various metaplastic changes in mesothelial cells probably offers one of the greatest challenges in cytology. Tuberculosis, cirrhosis, and

nonspecific types of inflammation are among the lesions that most frequently are interpreted as malignant in origin. It is our practice to be conservative in rendering a definitive diagnosis of a malignant process in studies on effusions. A cytologic report of suspicious-appearing cells coupled with suggested clinical evidence may result in a completely erroneous diagnosis of malignancy, particularly in those cases in which the tissue diagnosis of a malignant tumor has not been established.

Genitourinary Tract

Carcinoma of the genitourinary tract may be diagnosed by study of cytologic smears of urinary sediment and prostatic fluid. The less well-differentiated carcinomas of the urinary bladder yield enough positive findings to be of limited value. In well-differentiated papillary tumors of the urinary bladder, cytologic studies have been disappointing in that the exfoliated cells closely resemble normal transitional vesical epithelium. The same situation holds true for tumors of the ureter and renal pelvis. In symptomatic patients, the well-established methods of diagnosis for lesions of the urinary tract should be utilized in an effort to establish a diagnosis, and cytology should be resorted to only in selected cases. Negative cytologic results in the presence of urinary-tract symptoms are of no diagnostic significance. The high rate of falsely positive results in lesions thought to be in the upper part of the urinary tract makes it compulsory that operations should not be undertaken without corroborative evidence of a lesion. In selected cases, cytologic studies in the hands of experienced observers may provide ancillary laboratory evidence of a malignant tumor when an indeterminate renal lesion is demonstrated by other diagnostic methods. The high incidence of falsely negative results renders the method valueless for the screening of asymptomatic patients. Feeney and co-workers[14] suggested that smears may be of limited value in following patients who have been treated for transitional cell carcinoma, since these neoplasms tend to be multicentric and recurrent. Atypical cells under these circumstances would be an indication for cystoscopic and pyelographic studies. Foot and associates[15] reported a detection rate of 61.7 per cent for carcinoma of the bladder, ureter and renal pelvis as part of a study of urinary sediments in 2829 patients.

Cytologic studies of prostatic fluid in the hands of some qualified and interested investigators have yielded encouraging results. There is a tendency for a high rate of unsatisfactory smears in that it is difficult to collect and prepare the material. Recently, Clarke and Bamford[16] reported on 543 smears of prostatic fluid from 442 patients. Falsely negative results were obtained in 54 per cent of their series of cases and falsely positive results in 0.5 per cent. These authors were of the opinion that in men fifty years of age or older, palpation of the gland offered the best means of diagnosis prior to operation. Adenomyosis, chronic prostatitis, fibrosis, and prostatic calculi yielded a high percentage of atypical cells in the smears. These atypical cells easily may lead an unsuspecting cytologist to report an excessively high number of falsely suspicious smears. In routine practice, the prostatic smear is of little practical value in the detection of preclinical carcinoma of the prostate gland. As in the case of the kidney, the prostate gland is not readily available for complete histologic study and, unless a nodule can be palpated, one has no choice in selecting material for biopsy in order to confirm or disprove the cytologic findings. It is doubtful if smears of urinary sediment offer the clinician much help in the diagnosis of malignant lesions of the urinary tract that can be demonstrated readily by the more conventional diagnostic methods.

Stomach

Gastric secretions have not been widely utilized as a means of detecting malignant tumors of the stomach. Reports in the literature indicate that the yield of significant cells in gastric smears has varied from 33 to 95 per cent.[17] Because of the apparent difficulty in the cytologic detection of proved gastric carcinoma, many cumbersome and elaborate methods have been devised by which one may increase the number of gastric epithelial cells or malignant cells in the aspirated secretion.

Under certain conditions, malignant cells doubtlessly may be demonstrated in smears of gastric secretions; however, it is questionable as to how much these findings contribute to the discovery of early curable carcinoma of the stomach. Very occasionally, a gastric lesion that otherwise would be treated as benign has been found to be malignant through the use of gastric cytology. Negative results must be considered of little significance in the face of a rather high and consistent rate of

falsely negative results. The very nature of gastric carcinoma tends to produce falsely negative results in that many lesions are scirrhous in nature, and ulceration with superficial necrosis is frequently a predominant feature. The unusual lesion with mucosal spread and a large free surface from which to exfoliate cells is the lesion par excellence for detection by cytologic means.

A number of reports have demonstrated an extremely high correlation of positive smears with histologically proved gastric carcinoma. However, it is not clear from these reports as to how many of the lesions were diagnosed as malignant or as being suspiciously malignant by roentgenologic studies. To put it another way, how many unsuspected carcinomas were revealed by cytologic studies in patients diagnosed as having some benign lesion or as having no pathologic changes after an adequate history, a thorough physical examination, and roentgenographic studies? We are endeavoring to answer these questions. To date, we have studied gastric washings from slightly more than 100 patients. Malignant cells were demonstrated in the gastric washings from one patient who otherwise would have been diagnosed as having functional vomiting. This patient had a hiatal hernia and bizarre abdominal complaints. The gastric roentgenogram did not reveal any abnormal mucosal changes. The surgical specimen revealed a superficial carcinoma approximately 5 cm. in circumference associated with distant metastasis.

In another patient in whom malignant cells were found in the gastric washings, a roentgenologic diagnosis of carcinoma had been made. At operation, the surgeon was undecided as to whether the palpable lesion was malignant or represented some benign condition. On the strength of the cytologic findings, radical subtotal gastric resection was done. It was the surgeon's opinion that if he had proceeded on the basis of his clinical impression of the gross lesion, he would have attempted a less radical procedure and would have had to resort to removing the node-bearing tissues and spleen after having received the frozen-section diagnosis of carcinoma. This would not have particularly jeopardized the success of the surgical procedure but would have added approximately one hour to the length of the operation.

While both of these cases are interesting and represent the value of gastric cytology, they are unusual and basically are not the type of case that we are trying to evaluate. At present, our goal is to aid the internist in the management of an ulcerating gastric lesion that may or may not be benign. Cain and associates[18] demonstrated in approximately 10 per cent of ulcerating gastric lesions that the clinician is unable to arrive at a firm conclusion as to whether the lesion is a benign peptic ulcer or a small ulcerating gastric carcinoma. In approximately half of these cases, microscopic examination of the edge of the ulcer is necessary before the diagnosis of benignancy or malignancy is established. Until falsely negative results can be eliminated with a high degree of certainty, it appears that one must continue to treat these indeterminate ulcerating gastric lesions as being potentially malignant and to advise immediate surgical intervention rather than watchful waiting.

Lower Part of Esophagus and Cardia

The cytologic technique may be of considerable aid in the diagnosis of lesions in the lower part of the esophagus and in the cardia of the stomach.[19,20] Smears from this location usually are made directly from the lesion at the time of esophageal dilation by the use of cotton swabs, or they may be made directly from the esophageal dilator. Such smears are of use in clinically suspected malignant tumors and are of value in increasing the accuracy of biopsy, because material for biopsy often is necrotic or small in amount. This procedure is definitely an ancillary method to biopsy, but it has proved to be valuable in selected cases. A high degree of accuracy may be expected from this method.

Colon

A few enthusiastic reports in the literature call attention to the utilization of cytologic studies for detection of carcinoma of the colon above the proctoscopic range. Raskin and co-workers[21] recently reported thirty-eight proved colonic carcinomas in which results of cytologic studies were positive in thirty-six instances, together with a negative cytologic report in 145 cases. In ten of these thirty-six cases, the initial barium enema failed to make the diagnosis of carcinoma. These authors stated that five of the patients were subjected to repeat roentgenologic examinations only after a positive cytologic report was made. The preparation of washings from the colon is a time-consuming procedure and, while it may be of some value in selected cases, it is doubtful if this method

of cancer detection ever will become widely accepted by either the patient or the cytologist.

Mammary Gland

Much disagreement exists among physicians as to the significance of a bloody or serous discharge from the nipple and as to the best method of treatment in such cases. This dilemma naturally fosters the cytologic approach as a method of establishing the nature of the discharge. One should keep in mind that discharge from the nipple in the absence of a mass rarely is caused by carcinoma. If a mass is present in the breast, one should not temporize by making smears of the discharge but should resort to biopsy and then base therapeutic measures on the tissue report. According to Haagensen and associates,[22] 1.3 per cent of carcinomas of the breast are associated with serous or bloody discharge from the nipple. Madalin and co-workers[23] were able to demonstrate one carcinoma in 100 breasts removed because of discharge from the nipple; in this instance, the lesion was extremely small and was discovered after the breast had been removed as a prophylactic simple mastectomy because of carcinoma in the opposite breast. A total of forty-four of the 100 breasts exhibited intraductal papillomas, with the lesions being multiple in six instances.

Papanicolaou and associates[24] reported their experience with the cytologic study of mammary secretions in 1066 patients. In a group of forty-five proved mammary carcinomas, 60 per cent of the smears were considered suspicious or positive for carcinoma. Examination of smears from 613 breasts in 438 asymptomatic women disclosed one case of unsuspected *in situ* mammary carcinoma. Cellular clumps in cases of intraductal papilloma are said to be characteristic. Negative cytologic findings associated with a mass in the breast are unreliable and should not be considered of any value.

Positive findings may confirm a clinical impression, but they do not replace tissue diagnosis. A negative report, in the absence of a palpable lesion, particularly when associated with the cytologic picture of a papilloma, may be considered as significant. This concept is strengthened when one considers the statistical data pointing out the uncommon occurrence of discharge from the nipple associated with carcinoma. If smears of the secretion are to be made, one must remember that fixation of the wet smears is imperative in order to prevent distortion of the cells through drying. It is questionable if smears of mammary secretions will be of much help to the practicing physician as a means of detecting unsuspected carcinoma of the breast, and they actually may give a sense of false security.

Cerebrospinal Fluid

Smears of the sediment from cerebrospinal fluid occasionally are studied in an attempt to identify cellular types that cannot be recognized by the usual counting-chamber technique. Such studies also may be made in patients with bizarre neurologic findings and pleocytosis.

In our experience, satisfactory smears may be prepared by fixing the centrifuged sediment on frosted slides in 95 per cent ethanol and staining by the routine methods with hematoxylin and eosin. The total cell count and the proportions of identified cells are noted so as to give a rough estimation concerning the number and type of cells that should be found in the stained sediment. McCormack and associates[25] expressed a preference for the wet-smear technique using toluidine blue.

Smears of cerebrospinal fluid most often are useful in demonstrating carcinomatosis of the meninges, but cells from gliomas may be demonstrated on rare occasions.

The usually deep-seated location of malignant lesions in the brain accounts for the extremely rare phenomenon of shedding of malignant cells into the cerebrospinal fluid. In our experience, medulloblastomas are the most common gliomas to seed on the meninges, but seeding of astrocytomas and pinealomas has been reported. The relationship of the usual medulloblastoma to the fourth ventricle, in addition to its highly malignant nature, probably accounts for its more unorthodox behavior.

Malignant lymphomas and leukemia rarely may exfoliate cells into the cerebrospinal fluid. In metastatic lesions, particularly with a known primary source, the presence of malignant cells in the cerebrospinal fluid obviates craniotomy in the light of a hopeless situation.

Summary and Conclusions

Under certain optimal conditions, it is possible to demonstrate malignant cells in body fluids and secretions. It is also evident that cytologic studies in many instances are an unnecessary refinement

that may be added to well-established diagnostic methods. In selected cases, cytology has proved to be a valuable adjunct in arriving at a correct diagnosis that otherwise might have been overlooked. The rather high rate of falsely negative results obtained in most situations, except in those organs (such as the cervix) that can be readily seen, is a serious defect in the method.

The high degree of accuracy in suspected pulmonary neoplasms so situated as to exfoliate malignant cells has been of considerable value to surgeons in the operative treatment of carcinoma of the lung. A rate of falsely negative results of nearly 60 per cent in peripherally located carcinomas makes it necessary that most "coin lesions" be surgically removed for diagnosis.

The use of cytologic techniques as a screening method for the detection of preclinical carcinoma is applied most successfully to the uterine cervix. From the standpoint of screening large numbers of asymptomatic patients for malignant tumors, the uterine cervix is unique and offers the most promising field in the early detection of cancer for the practicing physician.

References

1. Papanicolaou, G. N., and Traut, H. F.: Diagnosis of Uterine Cancer by the Vaginal Smear. 46 pp. New York: The Commonwealth Fund, 1943.
2. Dockerty, M. B.: Some problems in the cytodetection of cervical carcinoma. J. Louisiana M. Soc., 109:229-233 (July) 1957.
3. Dahlin, D. C., Randall, L. M., Soule, E. H., and Dockerty, M. B.: Smears in the detection of preclinical carcinoma of the uterine cervix: Further studies with emphasis on the significance of the negative "repeats." Surg., Gynec. & Obst., 100:463-467 (Apr.) 1955.
4. Soule, E. H., and Dahlin, D. C.: Cytodetection of preclinical carcinoma of cervix: Ten years' experience with initial screening and repeat cervical smears. Proc. Staff Meet., Mayo Clin., 34:1-8 (Jan. 7) 1959.
5. Ullery, J. C., von Haam, Emmerich, and Miller, Edward: Early diagnosis and treatment in a cancer survey program: A preliminary report. Obst. & Gynec., 10:371-377 (Oct.) 1957.
6. Hecht, E. L.: The endometrial aspiration smear: Research status and clinical value. Am. J. Obst. & Gynec., 71:819-833 (Apr.) 1956.
7. Woolner, L. B., and McDonald, J. R.: Cytology of sputum and bronchial secretions: Studies on 588 patients with miscellaneous pulmonary lesions. Ann. Int. Med., 33:1164-1174 (Nov.) 1950.
8. Umiker, W. O.: Diagnosis of bronchogenic carcinoma: An evaluation of pulmonary cytology, bronchoscopy and scalene lymph node biopsy. Dis. Chest, 37:82-90 (Jan.) 1960.
9. Woolner, L. B., Andersen, H. A., and Bernatz, P. E.: "Occult" carcinoma of the bronchus: A study of fifteen cases of *in situ* or early invasive bronchogenic carcinoma. Dis. Chest, 37:278-288 (Mar.) 1960.
10. Woolner, L. B.: Personal communication to the author.
11. Rovelstad, R. A., Bartholomew, L. G., Cain, J. C., McKenzie, B. F., and Soule, E. H.: Ascites. I. The value of examination of ascitic fluid and blood for lipids and for proteins by electrophoresis. Gastroenterology, 34:436-450 (Mar.) 1958.
12. McGuckin, W. F., Soule, E. H., Cain, J. C., Bartholomew, L. G., and Rovelstad, R. A.: Ascites. III. The value of glycoprotein determination and cytology in the study of ascitic fluid. Gastroenterology, 37:332-338 (Sept.) 1959.
13. Leuallen, E. C., and Carr, D. T.: Pleural effusion: A statistical study of 436 patients. New England J. Med., 252:79-83 (Jan. 20) 1955.
14. Feeney, M. J., Mullenix, R. B., Prentiss, R. J., Martin, P. L., and Slate, T. A.: Cytological studies of the urine: Preliminary report. J. Urol., 79:589-595 (Mar.) 1958.
15. Foot, N. C., Papanicolaou, G. N., Holmquist, N. D., and Seybolt, J. F.: Exfoliative cytology in urinary sediment: A review of 2,829 cases. Cancer, 11:127-137 (Jan.-Feb.) 1958.
16. Clarke, B. G., and Bamford, Sophia B.: Cytology of the prostate gland in diagnosis of cancer, J.A.M.A., 172:1750-1753 (Apr. 16) 1960.
17. Garret, Marta, Rath, Hans, and Pareyma, Constantine: A comparison of the balloon and lavage techniques in gastric cancer detection and illustration of the cytological patterns of gastric cancer. Cancer, 13:192-199 (Jan.-Feb.) 1960.
18. Cain, J. C., Jordan, G. L., Jr., Comfort, M. W., and Gray, H. K.: Medically treated small gastric ulcer: Five-year follow-up study of 414 patients. J.A.M.A., 150:781-784 (Oct. 25) 1952.
19. Andersen, H. A., McDonald, J. R., and Olsen, A. M.: Cytologic diagnosis of carcinoma of the esophagus and cardia of the stomach. Proc. Staff Meet., Mayo Clin., 24:245-253 (May 11) 1949.
20. Johnson, W. D., Koss, L. G., Papanicolaou, G. N., and Seybolt, J. F.: Cytology of esophageal washings: Evaluation of 364 cases. Cancer, 8:951-957 (Sept.-Oct.) 1955.
21. Raskin, H. F., Kirsner, J. B., and Palmer, W. L.: Role of exfoliative cytology in the diagnosis of cancer of the digestive tract. J.A.M.A., 169:789-791 (Feb. 21) 1959.
22. Haagensen, C. D., Stout, A. P., and Phillips, J. S.: The papillary neoplasms of the breast: Benign intraductal papilloma. Ann. Surg., 133:18-36 (Jan.) 1951.
23. Madalin, H. E., Clagett, O. T., and McDonald, J. R.: Lesions of the breast associated with discharge from the nipple. Ann. Surg., 146:751-763 (Nov.) 1957.
24. Papanicolaou, G. N., Holmquist, Doris G., Bader, Genevieve M., and Falk, E. A.: Exfoliative cytology of the human mammary gland and its value in the diagnosis of cancer and other diseases of the breast. Cancer, 11:377-409 (Mar.-Apr.) 1958.
25. McCormack, L. J., Hazard, J. B., Belovich, Doris, and Gardner, W. J.: Identification of neoplastic cells in cerebrospinal fluid by a wet-film method. Cancer, 10:1293-1299 (Nov.-Dec.) 1957.

Descensus Uteri and Prolapse of the Vaginal Vault and Enterocele

Clinical and Surgical Considerations

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Uterine prolapse undoubtedly has plagued womankind ever since she acquired an erect posture and a soul. This article touches on the conservative management of prolapse, but it currently emphasizes that surgical correction is needed for cure. Use of vaginal hysterectomy is the technique of choice for repair.

UTERINE prolapse, or descensus uteri, may be likened to a hernia since the uterus and adjoining structures protrude through the vagina. It occurs with different degrees of severity. In first-degree prolapse, the uterus lies below its normal level but the cervix does not protrude from the vulva; second-degree prolapse is characterized by protrusion of the cervix at the vulva; in third-degree prolapse, or procidentia uteri, the entire uterus is extruded from the vagina and the entire vagina may be inverted.

Associated with prolapse of the uterus is some degree of involvement of the vaginal walls, bladder, urethra and rectum. Rectocele is partial herniation of the rectal wall into the vagina caused by stretching or laceration of the rectovaginal septum and separation of the levator ani muscles. Cystocele is partial herniation of the base of the bladder into the anterior part of the vagina caused by stretching of the vesicovaginal septum and relaxation of the pubocervical fascia and the cardinal-ligament system. Enterocele is an outpouching of the cul-de-sac of Douglas immediately behind the cervix between the uterosacral ligaments.

Etiologic Factors

The great majority of prolapses are preceded by lacerations during childbirth. Prolapse is encountered most frequently in older persons. Postmenopausally, loss of elastic fibers and atrophy of the vaginal mucosa often result in an increase in subjective complaints. It is during this time that a sudden increase in symptoms causes many patients with pelvic relaxation to seek aid.

Prolapse of the uterus occasionally is seen in women who never have borne children; in these patients, the cause may be congenital weakness of supporting tissues or may be on a neurogenic basis.

Repair of pelvic relaxation, which includes various degrees of descensus uteri, cystocele or rectocele, is the commonest indication for vaginal hysterectomy at the Mayo Clinic.[1] This indication was present in 254 (61 per cent) of the 415 patients who underwent vaginal hysterectomy here in 1955. Many patients who had severe uterine descensus were postmenopausal (Table I). Ninety of these 254 patients were sixty years of age or

TABLE I. AGE DISTRIBUTION BY INDICATIONS IN 415 CONSECUTIVE VAGINAL HYSTERECTOMIES AT THE MAYO CLINIC IN 1955*

Age, Years	Indications				
	Repair	Bleeding	Carcinoma in Situ	Fibroids	Miscellaneous
80+	1	1	—	—	—
70-79	16	1	—	—	1
60-69	73	6	4	—	5
50-59	73	15	8	3	3
40-49	68	34	20	3	2
30-39	20	14	29	1	3
20-29	3	4	4	—	—
Total	254	75	65	7	14

*From data presented in an article by Kempers and associates.[1]

older, and the oldest was more than eighty; this group included only twelve nulliparous patients beyond the menopause who had sufficient relaxation to warrant repair.

Signs and Symptoms

The patient with uterine descensus usually complains of a sensation of "falling out" of the vagina. She also may complain of backache, a dragging sensation in the pelvis, or a feeling of "sitting on a ball."[2] Vaginal bleeding, when present, is usually slight in amount and generally is caused by superficial ulcerations of the vaginal mucosa or cervix. Since most of these women have other associated features of pelvic relaxation, there also may be complaints referable to vesical descent, such as stress incontinence, or perineal relaxation, constipation, hemorrhoids and other rectal discomfort. Occasionally, patients who have severe cystocele may be perfectly continent, only to become incontinent after repair unless the repair has been performed properly and has included the tissues under the urethra. Jeffcoate[3] recently re-emphasized the importance of making the diagnosis of rectocele before the patient is anesthetized. Patients frequently have adequate support; however, the tissue relaxes when they are placed under anesthesia, and the tissues may become stretched when a weighted speculum is suspended from the vagina, producing a false impression of some degree of rectocele.

It is possible on occasions to mistake for simple prolapse the condition of hypertrophy and elongation of the cervix, which may occur with little or no pelvic relaxation. In such a situation, the cervix may be seen at or beyond the introitus, but examination reveals that the fundus is still high and well supported and possibly enlarged to the extent that vaginal hysterectomy would be difficult.

Pathologic Aspects

Other associated pathologic conditions may be present in addition to prolapse of the uterus, cystocele, rectocele and enterocele. Commonly, large amounts of residual urine contribute to the development of cystitis. When the cystocele is pronounced, angulation of the ureters may be present. However, subsequent hydroureter, hydronephrosis and pyelitis are rather rare.

Erosion, infection and the formation of decubitus ulcers on the cervix and vaginal mucosa are not unusual as the result of friction against the patient's thighs, clothing or protective napkins. A skinlike thickening of the vaginal mucosa that resembles leukoplakia may be produced by the drying action of air. While carcinoma may develop in these cervices, it has long been thought that the prolapsed cervix enjoys relative immunity to malignant disease,[4] an immunity that may be related to dryness of the tissue and the freedom from irritation by vaginal secretions. However, Taylor[5] found carcinoma of the cervix in prolapsed uteri on numerous occasions and considered that the patient with prolapse has no immunity to malignant changes in the cervix. This opinion is upheld in a recent report by Rocker,[6] who noted an 18 per cent incidence of malignant changes in procidentia and found carcinomatous changes in approximately 25 per cent of patients more than sixty years of age, in the majority of whom the procidentia had been present for more than ten years. At the clinic, except for an occasional in situ carcinoma, the combination of malignant tumors of the cervix and prolapse is extremely rare.

Anatomic Considerations

The following, with slight modifications and additions, is a summary of the supporting structures of the uterus and their respective functions as outlined by TeLinde.[7] These must be well understood in order best to utilize these structures in the surgical cure of prolapse.

Round Ligaments.—These ligaments draw the uterus forward and resist its backward displacement. One of the prime functions of these ligaments during pregnancy, when they are hypertrophied, is to hold the uterus in an optimal position during labor to allow the forces of labor to be directed through the pelvic axis. With relaxation of these ligaments and retrodisplacement, the axis of the uterus may be in the same direction as that of the vagina, and intra-abdominal pressure may force the uterus into the vagina in a pistonlike manner. However, if the other supporting structures are intact, the retrodisplaced uterus does not descend, although additional strain is placed on these other supporting structures.

Uterosacral Ligaments.—These ligaments are part of the endopelvic fascia and are continuous with the system of cardinal ligaments. They extend from the cervix posteriorly and aid in holding the cervix up and back. The cervix is displaced forward and downward when these ligaments are stretched as a result of childbearing, or if they are

congenitally long. This also causes retrodisplacement of the uterus and, again, the axis of the uterus is in the same direction as that of the vagina, facilitating intra-abdominal pressure to force the uterus into the vagina.

Cardinal Ligaments.—These ligaments, also called Mackenrodt's ligaments, are situated at the bases of the broad ligaments and are also continuous with the endopelvic fascia. They fan out laterally toward the sides of the pelvis from their lateral attachment on the cervix. These ligaments also may be congenitally relaxed, occasionally being considerably relaxed in nulliparous women who never have done strenuous work.

Fascial Sheath.—Encasing the vagina and making it a semirigid structure is a sheath of fascia that is continuous with the cardinal-ligament system. Anteriorly, it usually is described as the pubovesicocervical fascia and posteriorly as the rectovaginal fascia. Stretching or laceration of these fascial structures may result in rectocele and cystocele.

Muscular Floor of Pelvis.—Forming the floor on which the uterus and its supporting structures rest are the levator ani muscles. Descent of the uterus is facilitated when these pubococcygeal fibers become stretched or lacerated.

Mengert,[8] in 1936, investigated and described the relative significance of the various ligaments. He attached a 1-kg. weight to the cervix of each of eight cadavers and studied the effect of cutting paired uterine supporting structures. He found that the round, ovarian and infundibulopelvic ligaments, and the upper third of the broad ligaments, as well as the pubocervical fascia, had a negligible role in the support of the uterus. He noted also that the pelvic floor did not contribute much support since, after all other structures had been cut, the pelvic floor did not prevent prolapse. However, section of the lower two thirds of the broad ligament caused a uterine descent of 3.6 cm. and section of the upper third of the paravaginal tissue alone caused a descent of 6.9 cm. Severance of both of these structures allowed a descent of 10.5 cm. The uterosacral ligaments add a small amount of support because they are related so closely to the paracervical tissue. Thus, the paravaginal fascia of the upper third of the vagina and that of the cervix apparently are the most important structures in preventing descensus uteri.

Conservative Management of Uterine Prolapse

It is usually possible to support a prolapsed uterus with a properly fitted pessary, but the pessary should be used only with the understanding that it is a temporary support. We agree with Wharton,[9] who stated that it should rarely, if ever, be used in younger women for more than six months; in older women, its continued use may be necessary but is an admission of lost opportunity or inoperability. Occasionally, surgical correction may be contraindicated because of the patient's general physical condition, cardiac disease, diabetes, or hypertension, or because of far-advanced physiologic age. Rarely, one may see a woman with such pronounced relaxation of the pelvic diaphragm and perineum that a pessary cannot be worn. Once a pessary has been fitted, the patient must be instructed to remove and cleanse it frequently and to return for periodic medical inspection of the vaginal walls. Any evidence suggestive of inflammation or ulceration of the mucosa warrants leaving the instrument out of the vagina for a time. Certain types of pessaries may be removed with ease by the patient at bedtime or at times of minimal activity. Daily cleansing douches are necessary.

A great variety of pessaries are available, and the selection of the proper one may vary with individual circumstances. Taylor[5] advocated a soft, round, rubber "doughnut" pessary if the descensus is not excessive. This instrument supports the uterus by spreading the walls of the vagina in all directions and thus tensing the vaginal supports. Another widely used pessary is the Smith-Hodge type, which fits behind the pubis and exerts countertraction on the uterosacral ligaments and vagina. The fornix is pushed upward and backward, drawing the cervix in the same direction and consequently causing the fundus to be antiflexed. This pessary is recommended particularly for retroversion of the uterus and not for severe descensus. The round-ball pessary, the mushroom pessary, and the bee-cell pessary are all available for individual circumstances.

Occasionally, it is practical, particularly in the immediate postpartum period, to advise use of the perineometer, devised by Kegel,[10] for patients with mild laxity of the perineal muscles as well as mild urinary stress incontinence. Use of the perineometer at home for twenty minutes three times a day for several weeks frequently restores tone to the

perivaginal and periurethral muscles and restores function to the vaginal and urethral sphincters.

Another approach to conservative treatment has been reported by Anderson.[11] Using oral and parenteral administration of conjugated estrogens in four postmenopausal women with procidentia who either had refused operations or were poor surgical risks, he found that the procidentia disappeared after a few weeks of treatment. He suggested that perhaps the estrogens had restored the tone of the cardinal ligaments. Further confirmation must be awaited.

Surgical Measures

The surgical correction of uterine descensus is necessary for cure. Any progression in the amount of descensus or relaxation between periodic pelvic examinations indicates need for surgical repair since moderate relaxation is easier to repair than are the more severe forms, and a more satisfactory and functional vagina can be obtained. Age itself is not a contraindication; although the risk of any surgical procedure increases with age, the risk of vaginal hysterectomy is minimal, being approximately 0.1 per cent at the clinic.[1]

The more widely accepted procedures for surgical repair of descensus uteri are listed below. Satisfactory repair of stretched and scarred uterine supporting structures should be accomplished through the vagina. The abdominal procedures, such as uterine suspension and ventral fixation, should not be done for correction of uterine descensus unless repair of the vaginal walls is carried out at the same time.

Vaginal Hysterectomy.—Removal of the uterus through the vagina, with repair of the anterior and posterior vaginal walls, is the method favored in most American clinics. The principal steps in this procedure have been well described previously by Counseller[12] and by Pratt.[13] During vaginal hysterectomy and repair, an enterocele may be missed if the surgeon is not fully cognizant of the problem. Its repair or prevention is accomplished by obliterating or excising the redundant cul-de-sac of Douglas and then excising a corresponding wedge of mucosa from the posterior fornix.

Spalding-Richardson Operation.—This technique is recommended enthusiastically by TeLinde[7] as the operation of choice for many patients with prolapse. Advocates of this procedure are of the opinion that better support for the vaginal apex is obtained than with simple vaginal hysterectomy. The operation is basically subtotal hysterectomy and amputation of the lower part of the cervix. The middle portion of the cervix is preserved and utilized as a base for reattachment of the ligaments. This is followed by repair of the cystocele and colpoperineorrhaphy.

Manchester-Fothergill Operation.—This procedure[14] is used widely in England and Canada. The operation is especially applicable in less advanced degrees of descensus uteri because the parametrial tissues must be capable of aiding uterine support. Although original descriptions of this procedure suggested cervical amputation, this need not be accomplished if the patient still is interested in childbearing. In this procedure, the cardinal ligaments are reattached to the front of the uterus, holding the uterus upward and backward.

Colpocleisis.—Surgical closure of the vaginal canal[14] has a limited field of application and is contraindicated if the patient wishes to have sexual intercourse even occasionally. Therefore, use of this operation should be confined to the surgical treatment of elderly widows and patients who are considered to be poor surgical risks for any of the other procedures. The operation entails obliteration of the vaginal canal by approximation of the denuded vaginal walls with sutures. The most widely used of the colpocleisis techniques today is the Le Fort operation.

Watkins' Interposition Operation.—This is one of the oldest procedures for procidentia.[7] After cervical amputation, the uterine fundus is brought through an opening in the peritoneum of the anterior cul-de-sac, and the peritoneum is then sutured to the posterior wall of the lower uterine segment. The cornua are sutured to the subpubic arch, and the anterior surface of the uterus is covered by vaginal mucosa.

Prolapse of the Vaginal Vault After Total Removal of Uterus

According to Taylor,[5] the general experience is that 85 per cent of patients have satisfactory results after surgical repair of uterine prolapse, regardless of whether vaginal hysterectomy, the Spalding-Richardson method or the Manchester-Fothergill technique is used. However, only some of the remaining 15 per cent need further surgical treatment. The unsatisfactory results may occur, as in-

dicated previously, because a potential enterocele is not recognized and repaired at the time of operation for prolapse. Hematomas, pelvic infections and abscesses also may prevent proper healing of the repaired structures and result in weakened supports. The probability of successful repair of the prolapse is greatly increased if, associated with this procedure, good repair of the cystocele and rectocele is accomplished.

Many operations have been suggested for correction of the prolapsed vault or enterocele or both.[14] These have included fastening the apex of the vagina to the uterosacral ligaments and fascia over the fascia of the sacrum, or suturing the prolapsed vagina to the anterior abdominal wall. A number of fascial-sling operations have been described, and the Le Fort operation has been utilized.

The procedure used at the clinic is much like that for repair of the prolapsed uterus. An attempt is made vaginally to locate the cardinal and uterosacral ligaments; these are anchored together at either side of the apex of the vault, and any indicated repair of cystocele or rectocele then is carried out. Symmonds and Pratt[15] recently reviewed the examples of posthysterectomy prolapse seen at the clinic from 1945 through 1949; of sixty-nine such cases, thirty-nine followed hysterectomy performed elsewhere, the previous operation being either abdominal or vaginal hysterectomy. The remaining 30 instances of prolapse of the vault followed operations performed at the clinic, including twenty-one vaginal and nine total abdominal hysterectomies. Of the twenty-one cases of prolapse after vaginal hysterectomy, thirteen were examples of the technique of vaginal hysterectomy in which the paired ligaments are sutured to each other across the apex of the vault and then pulled forward beneath the bladder, which leaves a gap behind and between the uterosacral ligaments. With use of the current technique, it is thought that postoperative enteroceles will be seen less frequently than in the past.

The repair of recurrent prolapse of the vault with subsequent provision of a functional vagina is indeed a difficult problem. Symmonds and Pratt noted that 87 per cent of the patients undergoing repair of a prolapsed vault had satisfactory results. Although the approach may be made either abdominally or vaginally, we prefer the latter route, since repair requires some reconstruction of the vaginal walls.

Summary

Uterine prolapse may be of varying degrees of severity, ranging from displacement just below the normal level to extrusion of the entire uterus from the vagina. Generally, there is associated involvement of the vaginal walls in the form of rectocele, cystocele or enterocele.

The commonest cause of prolapse is injuries during childbirth, but occasionally it is seen in nulliparous women. Symptoms include "falling out" of the vagina, backache, a dragging sensation in the pelvis, or a feeling of "sitting on a ball." Other common symptoms are stress incontinence, constipation and hemorrhoids.

Most authorities agree that carcinoma is extremely rare in the prolapsed cervix.

Temporary support derived from pessaries may be indicated in some cases. However, surgical correction is required for cure. Vaginal hysterectomy, with repair of the vaginal walls, is the most widely used surgical technique. If postoperative prolapse of the vaginal vault occurs, it may be repaired by using a vaginal approach similar to that utilized in vaginal hysterectomy and repair.

References

1. Kempers, R. D., Hunter, J. S., Jr. and Welch, J. S.: Indications for vaginal hysterectomy. Obst. & Gynec., 13:677 (June) 1959.
2. Pratt, J. H.: Vaginal relaxations. Mississippi Doctor, 37:107 (Oct.) 1959.
3. Jeffcoate, T. N. A.: Posterior colpoperineorrhaphy. Am. J. Obst. & Gynec., 77:490 (Mar.) 1959.
4. Novak, Emil, and Novak, E. R.: Textbook of Gynecology. ed. 4. p. 800. Baltimore: Williams & Wilkins Company, 1952.
5. Taylor, E. S.: Essentials of Gynecology. p. 502. Philadelphia: Lea & Febiger, 1958.
6. Rocker, I.: Malignant changes in procidentia. J. Obst. & Gynaec. Brit. Emp., 65:89, 1958.
7. TeLinde, R. W.: Operative Gynecology. ed. 2. p. 902. Philadelphia: J. B. Lippincott Company, 1953.
8. Mengert W. F.: Mechanics for uterine support and position. I. Factors influencing uterine support (experimental study). Am. J. Obst. & Gynec., 31:775 (May) 1936.
9. Wharton, L. R.: Gynecology Including Female Urology. p. 253. Philadelphia: W. B. Saunders Company, 1947.
10. Kegel, A. H.: Progressive resistance exercise in the functional restoration of the perineal muscles. Am. J. Obst. & Gynec., 56:238 (Aug.) 1948.
11. Anderson, H. E.: Clinical use of estrogen in uterine prolapse. J.A.M.A., 168:173 (Sept.) 1958.
12. Counseller, V. S.: Vaginal hysterectomy: Indications, advantages and surgical technique. Obst. & Gynec., 1:84 (Jan.) 1953.
13. Pratt, J. H.: Technique of vaginal hysterectomy. Clin. Obst. & Gynec., 2:1125 (Dec.) 1959.
14. Parsons, Langdon, and Ulfelder, Howard: An Atlas of Pelvic Operations. p. 231. Philadelphia: W. B. Saunders Company, 1953.
15. Symmonds, R. E., and Pratt, J. H.: Vaginal prolapse following hysterectomy. Am. J. Obst. & Gynec., 79:899 (May) 1960.

Transventricular Approach to Mitral Valvotomy

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MOST SURGEONS have found the blind auricular approach satisfactory for the correction of the type of valvular stenosis that splits easily and widely with application of digital pressure in the direction of the commissures. However, where simple "finger fracture" fails and it becomes necessary to use instrumentation to divide the commissures, adequate mobilization of the valve is frequently not obtained. As experienced a surgeon as Bailey reported opening only one commissure in more than two-thirds of his first 1,000 patients producing an aperture estimated at only 25 per cent of the normal area. Dissatisfied with this approach, Bailey[1] popularized the right thoractomy, left atrial, approach which has proved to be satisfactory in his hands. However, using this latter approach, we have found it difficult to divide accurately the anterolateral commissure.

Long-term follow-up of patients subjected to mitral commissurotomy by the standard left atrial approach, shows that sustained improvement occurs in 66 per cent of cases, Bailey;[2] 66 per cent, Ellis;[3] 63 per cent, Turner;[4] 65 per cent, Baker.[5] While this is a considerable improvement over results treated by medical means alone, the failure of approximately one out of three operated patients to exhibit either lack of improvement, or lack of sustained improvement, accentuates the need for better surgical correction of the valve defect.

Restudy of the poor result group, using combined right and left heart catheterization techniques, shows in most instances that the deteriora-

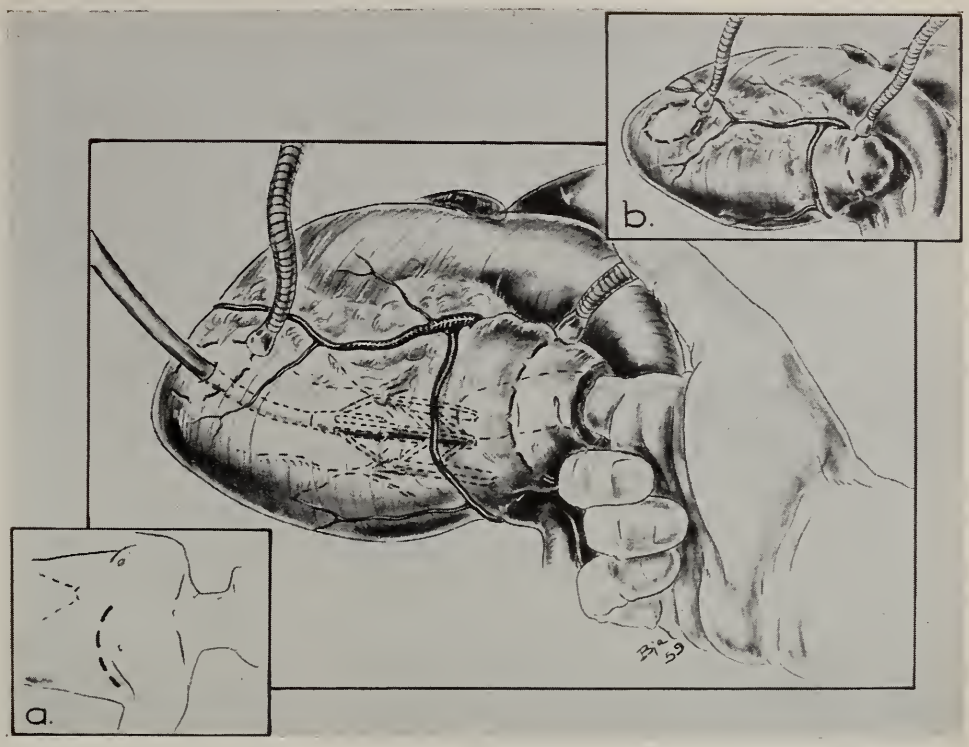


Fig. 1. *(a)* Chest is entered through the left fifth interspace. *(b)* Purse strings placed around the apex of the left ventricle, and at the base of the left auricular appendage. The *center* illustration shows the operator's finger inserted in the left atrium for inspection of the valve and direction of the dilator to its proper position in the mitral orifice. The dilator has been inserted through the apex of the left ventricle and has been opened to begin dilatation of the mitral valve.—(Reproduced through the courtesy of Dr. Denton A. Cooley, and the C. V. Mosby Company, from *Surgery,* 46:415, Aug., 1959).

tion of the patient is due to an inadequate valve orifice. We feel that the term "restenosis"[6] is a useful term to apply to those operated patients who have shown a striking initial improvement followed later by deterioration, provided the deterioration can be ascribed to an inadequate valve orifice. In reviewing the original operative reports on our patients who have developed recurrent symptoms of mitral heart disease due to restenosis, we note only an occasional case in which the valve split widely in both commissures. Recurrences[7] are obviously much more frequent in cases where valvotomy required incision by instrumentation and where mobilization of the valve was incomplete.

During the past year, Conklin[8] and also Cooley,[9] in this country, and Logan and Turner,[10] and Crum[11] in England, reported results of mitral commissurotomy accomplished by a two-bladed expanding dilator introduced by the transventricular route. Because of our dissatisfaction with the results obtained by transatrial valvotomy, we have

used the transventricular procedure in our last sixteen cases. The method appears to have considerable advantages over previous types of blind valvotomy.

Technique

In the transventricular approach to mitral valvotomy, a two-bladed dilator is inserted through a stab wound in the apex of the left ventricle and directed into the mitral valve from below. The position is checked by a finger inserted through the left atrium (Fig. 1). Blood loss (controlled by purse string apical and ventricular sutures) has been minimal. We have had no difficulty in avoiding the chordae tendineae and in placing the blades in proper position.

After the dilator is placed in proper position in the stenotic mitral orifice, and its position checked by means of the finger introduced through the left atrium, pressure is applied to the dilator until the valve splits. The dilator is then removed and the extent of the split checked. Usually, one can open the dilator to maximum size (3.5 cm.). After withdrawal of the dilator, the incision in the myocardium is closed with three or four silk sutures and the purse-string suture removed. The atrial incision can be closed in the usual manner, and the atrial appendage amputated. Occasionally, where the fish-mouth type of orifice of mitral stenosis is eccentrically placed with one commissure very short, and one very long, only the long commissure will split. In this situation, we have found it helpful to introduce the finger from the atrial side to the area of the commissure that has split and then reinsert the dilator from below and with the finger in place so as to protect the side that has already been split, all of the force of the dilator will be exerted against the unsplit commissure.

Results

We have been pleasantly surprised by the extent of the split obtained with the dilator. Usually both commissures split widely. In addition, the degree of mobilization of the septal cusp has been much greater than we have routinely obtained by other methods. The subvalvular stenotic area splits along with the commissural stenosis, something we were never able regularly to accomplish using the atrial approach. Bailey, as well as Logan and Turner, emphasize the advantages of splitting the commissure not merely to the atrial ventricular ring but continuing the split in a curved fashion along the free margin of the septal cusp so as to more adequately mobilize the latter valve cusp. This degree of mobilization can rarely be obtained by digital fracture. Most surgeons would hesitate to attempt this degree of mobilization with cutting instruments applied transatrially for fear of producing severe traumatic regurgitation. However, using the two-bladed dilator, applied through the ventricle, one can usually accomplish this degree of mobilization without undue risk. Initially, we were concerned about the likelihood of producing a traumatic regurgitation with what appeared to be a rather crude instrument. In thirty-eight cases, Conklin reports no increase in the operative risk (3.8 per cent) with less likelihood of producing or increasing valvular insufficiency. Cooley, eighteen cases, reports insufficiency as a complication in one case only, and that was treated successfully by subsequent open valvuloplasty. Turner and Logan, in 438 cases, using transventricular dilatation, report six fatalities (1.4 per cent) from traumatic incompetence, as compared to four deaths (1 per cent) from traumatic incompetence in 388 operations using the atrial approach. In sixteen cases of our own, significant valvular incompetence occurred as a complication of the operative procedure in one instance as will be described below.

Our own experience in mitral valvotomy done by the transventricular method includes sixteen cases operated on between May 1959, and April 1960. The ages range from thirty-one to fifty-seven. Six of the sixteen patients had had a previous valvotomy. One patient had had two previous valvotomies with relief of symptoms for four years after each procedure. In thirteen of the sixteen patients, both commissures were opened. In three patients the fish-mouth orifice was placed very eccentrically and in these three only the posterior commissure was opened. Postoperatively, the mitral orifice was considered to be quite adequate in all instances, and the degree of mobilization of the aortic valve cusp in all instances was accomplished to a much greater degree than we have been able to manage with the transatrial operation. There were two major complications, both occurring in the same patient (C.S.). This patient developed signs of massive cerebral embolism which occurred twenty-four hours after

TABLE I. RECORD OF SIXTEEN CASES

Case	Sex	Age	Date	First Operation	Repeat Operation	Both Commissures Opened	One Commissure Opened	Size of Aperture (Estimation)	Significant Incompensation
1. M.G.	F	50	1-20-60		x	x			0
2. S.B.	F	32	4- 5-60	x		x		3½ cm.	Grade 1
3. S.L.	F	28	3- 4-60		x	x		3 cm.	Grade 1
4. M.S.	F	45	3-15-60		x	x		3 cm.	0
5. L.H.	F	35	3- 2-60	x		x		Not recorded	Grade 1 pre 0 after split
6. M.P.	F	45	2-23-60	x			x (posterior)	Adequate	0
7. V.A.	M	40	2-19-60		3rd oper.	x		2½ fingers	Grade I-II 0 after split
8. B.M.	F	31	11-18-59	x		x		Not recorded	0
9. W.S.	M	57	9- 3-59	x		x		2½-3 fingers	1+ regurg.
10. N.W.	F	54	7-15-59		x		x (posterior)	3 cm. or better	1+ regurg.
11. J.A.	M	36	10-26-59	x		x		3 cm. or better	0
12. I.M.	F	37	11- 4-59		x		x (posterior)	3½ cm.	0
13. D.H.	F	32	7-31-59	x		x		2+ fingers	0
14. L.D.	M	44	6- 8-59	x		x		Not recorded	0
15. M.A.	F	34	5-21-59	x		x		3 fingers	0
16. C.S.	F	45	3-23-60		x	x		2½ cm.	2+ regurg.

surgery. The patient had an extensively calcified valve which had been split in the anterior commissure at a previous operation some five years before. At the time of her second operation, the mitral area had degenerated to essentially a tunnel of calcified and fibrotic tissue. The valve cusps were unrecognizable, as such. This patient not only developed an embolus but had a significant regurgitation following dilatation of the valve. The extent of the regurgitation was reduced by insertion of an Ivalon pad placed between the pericardium and the wall of the atrium at the atrial ventricular ring. Catheterization preoperatively revealed a pulmonary artery pressure of 100 in this patient. Postoperatively, her cardiac status is satisfactory. However, she has residual paralysis in the right arm and right leg and is aphasic.

The remaining fifteen patients have had no major complications and they are all strikingly improved.

Summary

1. The transatrial approach to mitral valvotomy proved to be satisfactory only in those patients in whom the valve split easily.

2. Long-term follow-up of patients subjected to mitral valvotomy by the standard left thoracotomy, left atrial, approach revealed initial improvement followed by deterioration in about one out of three patients.

3. The inadequate mobilization of the valve would appear to be the major factor responsible in the failure of mitral valvotomy.

4. Transventricular valvotomy, accomplished by the use of a two-bladed expanding dilator provides much more adequate mobilization of the valve with no appreciable increase in operative risk.

5. This paper briefly describes the technique and summarizes the results that we have obtained in sixteen consecutive cases.

References

1. Bailey, Charles P., and Morse, Dryden, P.: Mitral commissurotomy performed from the right side. J. Thoracic Surg., 33:427 (Apr.) 1957.
2. Bailey, Charles P., and Morse, Dryden P.: Recurrent mitral stenosis: An increasingly common occurrence due to inadequate mobilization of valve. J. Int. Coll. Surgeons, 31:8-23 (Jan.) 1959.
3. Ellis, L. B., Abelmann, W. H., and Harken, D. E.: Selection of patients for mitral and aortic valvuloplasty. Circulation, 15:924 (June) 1957.
4. Turner, R. W., and Fraser, H. R.: Mitral valvotomy. Progress report. Lancet, 2:525 (Sept. 15) 1956.
5. Baker, Charles, Brock, Russell, and Campbell, Maurice: Mitral valvotomy: A follow-up of 45 patients for three years and over. Brit. Med. J., 2: 983 (Oct. 22) 1955.
6. Belcher, J. R.: Restenosis of the mitral valve. Brit. Heart J., 20:76, 1958.
7. Glover, R. P., Davila, J. C., O'Neill, T. J. E., and Janton, O. H.: Does mitral stenosis recur after commissurotomy? Circulation, 11:14 (Jan.) 1955.
8. Conklin, William S., Maurice, Gordon L., and Bergquist, Stanley F.: Mitral valve surgery: Transventricular valvuloplasty and use of Ivalon sponge pack for mitral insufficiency. Dis. Chest, 35:291 (Mar.) 1959.
9. Cooley, D. A., and Stoneburner, J. M.: Transventricular mitral valvotomy. Surgery, 46:414 (Aug.) 1959.
10. Logan, Andrew, and Turner, Richard: Surgical treatment of mitral stenosis with particular reference to the transventricular approach with a mechanical dilator. Lancet, 2:874 (Nov. 21) 1959.
11. Crum, Hugh B., and Tsopogas, M. J. C.: Transventricular mitral valvotomy. Lancet, 2:880 (Nov. 21) 1959.

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The Law and Medical Science

A new approach to the betterment of expert testimony in personal injury cases; systematic indoctrination in the proofs of science and the science of proof.

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Justice can be achieved only in litigation, whether civil or criminal, if the facts found by judge or jury correspond with truth. There has been a constant search in this country, for many years, for solutions to the vexatious problems, multiple in nature, which spring from use of expert testimony. Thus, many states now permit by statute, or rule of court, appointment of impartial physicians or other experts, by the trial judge, to carry out impartial examinations of the claimant, in personal injury cases, of the accused claiming a mental defense in criminal cases, or of inanimate subject matter in some instances. Accompanying these broad discovery provisions, which have been so effectual as a part of the federal rules of civil procedure that they have been widely copied by the several states, have been liberal reforms, in most states, permitting the taking of depositions of parties and witnesses prior to trial. By thoroughgoing direct and cross-examination, qualified counsel can extract from treating and examining physicians, and other expert witnesses, the full facts as to what they did and found and force into the open the medical contentions which will be made, at the same time crystalizing, defining and restricting the issues. By assembling past medical and hospital records, and taking depositions of all the treating or examining physicians, the parties can define and limit the medicolegal issues at an early state of the litigation. Since the founding of the law-science movement in this country, which may reasonably be linked with the initiation of our law-science short courses at Tulane University in 1950, the percentage of personal injury cases disposed of by pre-trial compromise negotiation has risen from some 45 per cent to close to 90 per cent! Counselors are now quite willing to concede that it is important to use the best available specialists, and necessarily to exchange freely medical reports, without putting the opponent to the unnecessary trouble of taking depositions.

At the same time, there is a great unevenness in the quality of expert testimony in our trial courts, both in civil and in criminal cases. Only some six states of the union require a physician to be a certified specialist in order to qualify him to testify on a specialty problem. The field of medicine has now broken down into some thirty-five recognized medical specialties and the judge who permits the general practitioner to give opinion evidence on specialty subjects, would be the first to take the train for Mayo Clinic in event he had some serious health problem arise.

Some have assumed that the giving of unscientific medical evidence testimony is a badge of fraud, but it is my conviction, after studying the matter for many years, that ignorance is a greater foe of justice than misrepresentation. We need to tighten up our qualifications for expert witnesses, *en-voir dire* (the qualifying) examination.

While the treating physician should always be allowed to testify, whether he be a specialist or not, close control should be exercised to the end of determining important litigation, dependent upon advanced, skilled knowledge of a specialist, upon testimony of general practitioners.

As most readers will realize, the New York Academy of Medicine has recently cooperated with the trial courts of New York in supplying outstanding medical specialists, drawn from a rotating panel, to study particular cases in which the courts have applied for help. This is a step forward, and perhaps the gravest criticism which can be leveled at the plan is the fact that the trial judge customarily refers to this specially selected witness as the court's witness, thereby throwing the mantle of omniscience over him. This seems undesirable, and it would suffice if the court merely indicated that the expert witness had examined, without objection of the parties, with the understanding that both parties would be able to cross-examine him freely, permitting the jury to give his testimony deserved weight.

Another solution which has been coming forward at intervals in recent years, is a suggestion for abolition of trial by jury, and even for abandonment of trial of these cases by judges without juries. The contention is sometimes made that an administrative tribunal, not bound by the common law rules of evidence, could gain a special skill in handling such cases, and dispatch claims more expeditiously and justly. After studying this matter for a number of years, we entertain grave doubts as to whether such a mechanism would improve the current level of practice. Indeed, we are persuaded that adversary trial, when streamlined and speeded up, with full rights of direct and cross-examination of witnesses protected, makes for a more thorough preparation, and presentation of evidence than any other known mechanism for determining disputed facts. These conclusions of ours, based upon many experimental trials, where the proceedings and deliberations were tape-recorded, have been corroborated in recent months by research studies carried out by sociologists at the University of Chicago Law School, on trial by jury. It is my belief that the need of the times is to train law-science advocates—a new species of trial lawyer who is deeply grounded in the proofs of science and the science of proof. Certainly, the whole trial process must move forward to a scientific level, if trial practice is to survive in an age which demands objectivity and speed.

If I may say so, with proper modesty, the Law-Science Institute of the University of Texas, the Law-Science Academy of America, and the Law-Science Foundation of America, have been the chief leaders in developing authoritative scientific instruction for trial lawyers in this country. Together, they have conducted during the past ten years, more than forty national institutes, or short courses, and these have been attended by more than 6,000 lawyers and physicians from all parts of the United States. The Law-Science Institute of the University of Texas was the first such institute organized to carry out research and teaching between law and medicine. Indeed, its purposes are even broader, namely, to promote, by every proper measure, the integration of law with the physical, medical, psychological and social sciences. The basic premise is that law cannot abandon its historical heritage, but must subject itself constantly to extrinsic criticism of other intellectual disciplines, insofar as these are relevant to fact-finding, or policy formation. The day of intellectual isolationism is gone. The great need of the time is for synthesis of knowledge, using a multi-dimensional approach, and giving each distinct intellectual discipline which has a title to speak, an opportunity to be heard. As we view the progress of human knowledge, we may divide research into two varieties. One is primary, analytical research, in which facts are broken down, or fragmented, into even smaller facts, with the result that we pass from one universe of knowledge to another, constantly seeking final mechanisms, ultimate facts, or at least controlling basic principles. The other type of research, which has been much wanting on the American scene, involves the task of inter-relating bodies of knowledge. Such cooperation can result in improvement of justice, solution of many difficult problems which will not yield to the analysis of a single intellectual discipline, and establishment of valued judgments based upon an integration of knowledge and culture. One line of research cannot take the place of the other, but both must proceed concurrently. By its very nature, since law must assume to regulate every activity of mankind, law has a capital opportunity to become a master social science in this process of integration of knowledge.

Now, this need for integration of knowledge is particularly keen when we come to complex catas-

trophic injuries. Such injuries usually involve more than one organ system of the body and invoke the attention of several different types of specialists. In order to arrive at any fair judgment as to the fact and degree of injury and disability and vexatious problems as to whether the traumatic stimulus caused, aggravated or precipitated (or accelerated) the claimant's disease or death, we may have to relate various doctrines or substantive law with the contributions of several medical and scientific specialties, including the work of such non-medical men as clinical psychologists and physicists. The training given in American law schools today simply does not equip the oncoming young trial lawyer with the basic knowledge, or skills, to carry out this task of analysis and synthesis, which can be met only by a properly trained law-science advocate.

To meet this great deficit, two steps have been taken. The Law-Science Institute at the University of Texas has introduced ambitious instruction in "Legal Medicine and Elements of Medicolegal Litigation" for law students interested in trial practice. This is a course which meets four hours each week, and it is not unusual, though it is an elective subject, for approximately 100 of the students to take the course each year. Under our practice, the human body is divided into nine organ systems, the tenth area is reserved for medicolegal problems involving the total personality, and thus corresponding to psychiatry (and other behavioral sciences) and clinical psychology. The eleventh area is reserved for "Medicolegal Trial Technique." Students are encouraged to do collateral research, both in the Medical Library, on select subjects, and in the Law Library, in an effort to inter-relate relevant materials. The institute has been instrumental, through the years, in developing more than 170 published studies on important, frequently recurring medicolegal problems, and these have appeared in leading law and medical journals, indicating that the goal of basic English has been reached without making the material elementary.

In recent years, the Law-Science Academy of America, and the Law-Science Foundation of America have come to the aid of the Law-Science Institute in this tremendous undertaking, involving both continuing medicolegal education of practicing lawyers and physicians, as well as insurance company personnel, and others professionally concerned with medicolegal problems, and in developing ever-increasing instruction, by way of seminars, for the undergraduate law students.

The Law-Science Academy of America and the Law-Science Foundation of America are non-profit, charitable societies, so recognized by the department of internal revenue, which are devoted to the same broad purposes as the Law Science Institute, but specifically, at the moment, to furthering practical integrations of law with other fields of learning. The implications of this pragmatic movement can be tremendous. Obviously, there is a great need to integrate business practice with law, political theory and practice with law, economics with law, etc. One of the more challenging areas involves integration of behavioral sciences with law. It is our contention that only behavioral sciences can explain human behavior, and that only law can regulate it, and that therein lies the basis of a necessary and enduring partnership. The whole reformation for our antiquated criminal law and penology depends on the rapid acceptation of these premises. It is interesting to me that lawyers everywhere seem enthusiastic, rather than resistive, in connection with the proposed infiltration of law with relevant scientific materials. Recently, at one of our short courses held in New Orleans, the eminent neurosurgeon, Dr. James C. White, Professor of Neurological Surgery at Harvard Medical School, stated that he found the lawyers to be more avid students of medicine than the medical students and doctors themselves. On all sides, we see a quickening of interest among lawyers in this trend toward a multidimensional approach to legal thought and action. Spearheading this national movement, has been the Law-Science Academy of America, which has advanced from a membership of ninety, some two years ago, to some 700 leading lawyers and physicians in this country today. Every lawyer and physician in good standing, who is motivated toward the purposes of bettering social conditions, including the administration of justice, through cooperation of law and science, is eligible for membership. Various grades of membership exist, and various types of honors may be won on the basis of concrete achievement.

The current president of the Law-Science Academy of America is Dr. A. Earle Walker, Professor and Chairman of Neurological Surgery at Johns Hopkins Medical School, generally recognized as one of the leading research men and clinicians in his field. Recently, he returned from London

where he served for a month as Professor of Neurological Surgery at Guys Hospital. Current chancellor of the Law-Science Foundation is Dr. Herbert C. Modlin, senior psychiatrist at Menninger Clinic and Foundation, widely esteemed as the leader in the behavioral sciences, and generally accepted as one of the foremost exponents of integration of behavioral sciences and law. Dr. Hubert Winston Smith has been elected lifetime chancellor of the Law-Science Academy and as lifetime president of the Law-Science Foundation, and gives administrative continuity, in conjunction with the Boards of Trustees, in development of the ongoing programs of the two organizations.

In their determined efforts to hasten the training of an adequate, elite corps of Law-Science advocates in this country, the Academy and Foundation have established a unique summer instructional program in Crested Butte, Colorado, once a bustling mining town, 30 miles from Aspen. When the Colorado Fuel and Iron Company closed its mines, in about 1953, the population dwindled markedly, and for a time, there was a real risk that the village might become a ghost town and undergo continuing dissolution. Three years ago, however, the Law-Science Academy purchased Old Union Hall, a large two-story structure in Crested Butte, and completely remodeled it, in keeping with the spirit of the town. Last summer, the Academy held its first summer teaching effort there, offering four individual weeks of instruction, featuring top medical specialists and trial lawyers of this country. This year, the instruction was stepped up to nine weeks, running from June 13 through August 12, 1960. Each week of the instruction is a separate course, but there is an inter-linking continuity which makes prolonged attendance highly beneficial to those who can stay for longer periods.

In keeping with the idealistic purposes of the Law-Science Academy and Foundation, printed announcements were mailed to every Law Dean in America, indicating that carefully selected students would be eligible for scholarships at Crested Butte. It is hoped that a big brother relationship can be established between the distinguished visiting physicians and trial lawyers, on the lecturing staff, and the embryonic trial lawyers. It is possible, in the beautiful, restful setting of Crested Butte, to carry out instruction on an informal, seminar basis with maintenance of maximum arousal, interest and participation by both students and lecturers. A wealth of audio-visual material is used. On two evenings, the great trial lawyers of the country conduct three-hour seminars on "Medicolegal Trial Technique."

The Law-Science Academy has recently purchased an adjoining building which will be converted into an incomparable Law-Science Library. The goal of the Law-Science Academy and Foundation extends even further than the mere integration of law and medicine. It is hoped that a unique cultural center can be established at Crested Butte, where unusual, creative individuals in all the arts and humanities, can spend time together and receive stimulation from fields other than their own.

Thus, it is anticipated that, eventually, those who come primarily for law-science training, and incidental family vacation activities, will have a variety of choices, in the late afternoons, or evenings, to attend such cultural activities as: a great book series; teas devoted to discussion of literature, art and painting; politics; economics; art appreciation; and a host of other subjects calculated to be of deep interest to the inquiring mind. Thus, the dream of Crested Butte, is not only to sharpen those who come, but to broaden them. Situated in a valley surrounded by towering mountains, Crested Butte has been acclaimed as one of the most beautiful spots in North America. Both lawyers and physicians being diversified in their intellectual interests, with predilections toward various arts, sciences and humanities, and their preliminary preparation for their professional careers, so that Crested Butte's visiting guests are likely to have ranging interests. Already ambitious steps are under way to fashion a plan for this cultural development. Those who have been captivated by its charms have already rechristened "Crested Butte Mountain" the "Magic Mountain." Academy members plan, in future days, to have winter meetings there, as well, which will be combined with winter sports, skiing, sleigh riding and playing in the snow.

Running concurrently with the teaching plans at Crested Butte is an ambitious publication program, now in its formative stages, designed to create criteria of proof in respect to the relationship of trauma to injury and disease. These will involve participation by the most eminent living medical authorities, as well as distinguished trial lawyers, and are expected to be issued in monograph form, beginning at an early date.

Blindness

A Vital Challenge to the Professional Team

There are 18,000 blind and visually handicapped people in Minnesota. Our cultural attitudes of rejecting, feeling benevolent towards, or rationalizing over an act of nature in blindness, have gradually evolved towards a new approach of rehabilitation and integration. As state director of Services for the Blind, the author reviews the spectrum of blindness and its challenge to modern medical practice.

THE PERSON who is faced with or has experienced the loss of his sight is troubled by two major concerns—of one of them he is very much aware; he desperately wants to see again. When this is medically possible, his problem is solved. This paper concerns itself with the treatment of the person who is destined to live his life with partial or total blindness and his deep struggle with what this means to him.

The physician has too frequently assumed that a hopeless physical prognosis concludes his professional relationship with his patient. I should like to assert during the course of this paper that this is not quite so. I am not a physician. Yet, I have found it expedient and necessary to learn considerable from those of you who are in order that I might function with deference to your patients'—my clients'—physical needs. I am a psychologist and it is my professional responsibility, and that of my colleagues in education and social work, to apply effectively the best knowledge and pertinent insights of our time to the personal, social and vocational improvement of blind persons. We welcome this opportunity to share with you current thinking from the social sciences relative to the handling of this disability which you may find useful in functioning with deference to the patient's social and psychological needs and in assisting him to secure an opportunity to rebuild a useful and gratifying life.

The Individual and His New Experience

The physician is usually the first professional person to consider the patient's needs. A pattern is well established in Minnesota in which visually impaired persons discovered by State Services for the Blind and our cooperating agencies require immediate referral to the family physician and the ophthalmologist of the patient's choice. Increasing numbers of our clients are referred to us by physicians, but many others are discovered and referred to us from a variety of other sources after they have struggled with blindness for many years and perhaps consulted their physician many times. In my judgment, the physician's imperative role is not fulfilled until he has arranged for or referred the patient with educational, social or vocational needs to appropriate services which lie beyond the direct orbit of his practice. Some of these needs derive from obvious and others from subtle sources. Some are clear to the patient, while others lie below the surface of his awareness. In a new and strange environment, needs can be related only to the hazards and possibilities which it holds. The blind person has lost only one of his attributes. In this strange new world, his behavior will be conditioned substantially by his previous experience and the many other personal characteristics which he brings into it. This is to say that persons vary in their capacity to tolerate negative experiences. This is also to say that the depth of anxiety and depression

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and whether it is overtly expressed, contained or disguised will be determined chiefly by the following factors: (1) personality, maturity and socialization, (2) intensity of special interests and aptitudes, (3) nature of motivational values and (4) status security concepts.

The Patient May Be Sensitive

The physician is usually consulted rather immediately after the patient has become aware of his disability, or with children, when the parent becomes aware of a severe malfunction. The patient is likely, at this time, to be highly sensitive, anxious and uncertain and, thus, psychologically highly vulnerable to suggestion. He will seek clues to his future, not only in the physician's words, but in his manner. He may interpret and misinterpret in his desire to determine whether his physician holds out any hope for him, and at this point, hope to him means the capacity to see again. If he develops an ill-founded impression that his lost capacity may be restored, he may, as many have done, spend his life and his resources and those of his family seeking an ever-elusive cure. If, on the other hand, he is faced with the futility of such a hope, he will often be in desperate need of understanding and insightful assistance in reconstructing his life. Without this, he will assume the unhappy and devaluating role ascribed to blindness by the stereotype of this condition, still strong in our culture.

The problems faced by blind and visually impaired persons are, perhaps, most meaningfully examined by distinguishing between those limitations of performance inevitably implied by the inability to see and those, usually the more damaging functional (psychological sense) or psychosomatic barriers, which limit social and vocational effectiveness and personal tranquility.

In working with visually impaired persons, an awareness of the difficulties they are experiencing and a familiarity with current philosophy, methods and resources, most appropriate to their educational, social and vocational development is of essential usefulness.

Practical Effects of Visual Isolation

Blindness and deafness are the great sensory cripplers of man. Impairments of taste, touch and smell are rare as primary conditions and seldom disabling. It has been rather well established that 85 per cent or more of the sensory experience of non-handicapped persons is visual. It is immediately apparent then that blindness places its victim in substantial isolation by interfering with the flow of information from the outside world to the brain. Blindness is then (1) an *informational handicap.*

The eye is an organ of expression. It is often considered more subtle and more fluent than the tongue. A seeing person seldom speaks without establishing his audience by visual contact first. Blindness is then (2) a *communication handicap.*

A seeing person orders himself in his environment by visual cues. He knows where he is by observing the way he has come. He identifies those about him by appearance, manner and dress. He determines the appropriateness of the clothes he wears by observing himself. He selects, locates and guides his food to his mouth with visual cues. He

maintains his direction and protects himself from collision as he moves about by visual observation. Blindness is (3) a severe *orientation handicap.*

This set of very practical limitations is quickly felt by every newly blinded person. They are unique to blindness. No set of hopeful sounding cliches, such as are often widely applied with every good intention to the problems of all handicapped persons, will alleviate these severe barriers to performance one bit. Only the persistent effort of individual blind persons, combined with the most diligent application of multi-discipline knowledge which we can co-operatively bring, has any genuine meaning.

The Physical Versus the Functional Problem

Before discussing current approaches, we will consider for a few minutes the nature and the origin of the functional by-product of blindness which arises from human rather than nature's error and is the more defeating. The child who grows up without his sight develops a rather accurate notion about the meaning of his loss by the time he is six or eight years old. Yet, this insight does not compare in destructiveness with the role into which he is frequently forced in which he is used to meet the emotional needs of unthinking persons around him—usually adults. He must be "the poor child," "the brave child"; he must submit to sincere acts of consideration, which he often doesn't need, and he must at times be the object of demonstrations which adults assume in order to impress one another. He has much too frequently been removed from his home and community for educational purposes even though in many instances this is not necessary. The blind child with good parents who will be allies in facing his problems needs them very much as does any child.

The adult who traumatically loses his sight soon finds that the devastation that grips him is not nearly so related to his new inability to perceive the world about him at a glance as it is to how his family and his associates will look upon him as a blind person. He worries about his marital relationship, the attitudes of his children, the loss of his friends and his job. Individuals vary widely in their capacities to assimilate negative experiences. Our concern here, however, is with the fact that the reason for the depression which follows the onset of blindness almost invariably will rapidly become focused upon personal depreciation, specifically around inter-personal relationships and social and vocational acceptance rather than around the direct effects of the physical function which is lost.

History Inhibits Blind and Seeing

Society's attitudes toward deformity are grounded deep in our culture and have moved through four principal stages and, although the pattern is similar toward all readily observable physical deformities, the frequency with which blindness is discussed in both religious and secular, ancient and modern literature leads one easily to the belief that through the ages it has concerned and disturbed man more than any other abnormality.

In an elementary culture in which each individual had to meet nearly all of his own needs by his own devices, a blind person could not survive. Since blindness meant death, it was greatly feared. The birth of a blind child soon became an omen of evil upon the mother and family, with feared religious meaning. Such children, and their mothers with them, were often destroyed.

With the rise of the modern religions, the old attitudes toward blindness and methods for dealing with it were recognized as inhumane and incompatible with the new ethic. The many biblical references to blindness frequently equating it with sin, disease and poverty in the beggar's role call for compassion and pity. They establish the blind person's right to live, though only at the material benevolence of other men.

Blindness made a deep impression, however, and in time there were many persons who felt a logical necessity for attempting to square the compassion and the justice of God with the apparent injustice suffered by blind persons whom they observed. This led to commonly accepted rationalizations which attributed extra sensory perception as well as the notion that blind persons were compensated by more acute senses of hearing and touch, cleverness, musical gifts, etc. Still others explained that blind persons were appointed by God to remind other men of how fortunately they had been blessed with the capacity to see. These strange views were further isolating. We may say then, that the first three attitudinal stages toward blindness were (1) rejection, (2) benevolence, and (3) rationalization. The first denied him life; the second denied him hope; the third denied him fraternity. Each step of the way the new attitude

was added to the old; it did not replace it. All are reflected in our culture today. Most people carry segments of these feelings below the surface of their awareness and for this reason, when they meet a blind person, may feel uncomfortable. The intensity of this experience is likely to depend upon the suddenness and closeness of the relationship. Whether these feelings are fleeting or permanently bar interpersonal relationships is dependent primarily upon whether the blind person feels awkward, and is chronically disturbed about his condition, or whether he has had and been able to use opportunity to grow beyond the pervasion of his personality by blindness, and sees himself as a whole, complete and effective person. We believe that today's approaches to the rehabilitation and integration of the disabled person reflect the fourth and newest of society's attitudes toward blind persons.

Four Steps in the Rehabilitation Process

We may consider the rehabilitation process in four steps which are designed to reduce both the physical and psychological damage of disability and permit the individual to bring himself to maximum usefulness and dignity.

1. *Prevention.*—If we can prevent a disability or halt the progress of disease early through public education and public screening, we have obviously accomplished the most desirable goal. Half of present-day blindness is preventable according to the National Society for the Prevention of Blindness. If we can create in the public mind a modified, more accurate and more healthful picture of the comfortable and participating blind person, we will go far in preventing the emotional damage to both blind and seeing persons which we have discussed as the cultural image.

2. *Restoration and Alleviation.*—When disability strikes, medicine is obviously the first line of defense. The most significant service that can be provided any person is, of course, to restore the capacity which he has lost or alleviate to every feasible degree its damage. We are interested in general physical health as well as eye pathology since additional problems are frequently uncovered which, without attention, may lead to multiple handicaps. At this stage, too, we are concerned with early emotional involvements. The newly blinded person may assume that the whole course of his life is changed. The entire structure of aspiration and motivation which he has constructed from childhood, the foundation of his life movement and mental health frequently crumbles rapidly. Rehabilitation services can often be of substantial assistance in confining these changes of self-concept to those actually and necessarily imposed by the disability.

3. *Compensation.*—The mastery of a vast body of skills involving the efficient use of the other senses in collecting information, in communicating and in orienting to the world are essential to the blind person who would minimize his problems. Compensation also involves the development of new interests and activities to replace those which may have been rendered less pleasurable by blindness and often some new attitudes. Dependent upon whether the disability is total or partial, new methods for accomplishing old tasks may include dressing and feeding, braille and typing, travel training and physical orientation, social relationships and many other personal skills. Compensation also takes the form of vocational and homemaker training.

4. *Accommodation.*—At this step in the rehabilitation process we are anxious that the blind person recognize those aspects of his disability which remain as a personal liability—untreatable, uncompensable. Every blind person has them but it is important that he look at them for what they are; that he no longer allow blindness to pervade his personality and interfere with his movement toward life; that he sees blindness as one of a multitude of personal characteristics. He need not like the blindness but as he sees himself in total, he should find normal self-esteem and confidence.

Prevalence of Blindness in the United States and Minnesota

Estimates of the total number of partially seeing and blind persons in Minnesota and the nation are based upon sample studies. In the United States they vary from 350,000 using the common 20/200 definition of blindness with best correction (Hurlin's Projections[1]) to 960,000, using as a definition the inability to read newsprint with correction (National Health Survey[2]). Hurlin's estimate for Minnesota is 1.9 per thousand or approximately 6,500. University of Minnesota studies[3]

estimate the total blind and visually handicapped population in Minnesota as 18,000. Previous studies suggest a ratio of 4 to 1 partially seeing to blind or 32,500 visually handicapped persons in Minnesota. Eight thousand visually handicapped, 4,000 of whom are legally blind, are known to State Services for the Blind.

Rehabilitation Services Available

Blind or partially seeing persons may be referred for service to county welfare departments or to State Services for the Blind and Visually Handicapped. Services available include counsel and information for parents with pre-school blind and visually handicapped children, special education, planning and placement carried out in co-operation with local superintendents of schools and the Division of Special Education who have prime responsibility for the educational placement and instruction of handicapped children except for those requiring residential school enrollment.

My colleague, Mr. Bourgeault, discusses the challenging and rapidly developing educational programs for blind and partially seeing children in the accompanying paper. Adolescents and adults may be referred for the broad scope of personal adjustment and rehabilitation services previously discussed. In Minnesota we are fortunate to have skilled state workers and a unique regional rehabilitation center sponsored by a voluntary agency, the Minneapolis Society for the Blind. St. Paul and Duluth also have voluntary agencies for the blind providing primarily sheltered employment. Emphasis is placed, however, on the use of regular community services, trade and vocational schools or colleges for vocational preparation as soon as the individual is ready for competitive experience. State rehabilitation counselors assist these agencies as necessary.

We are interested, too, in the problems of aging blind persons in their own homes or in nursing homes. Age and blindness both carry dependency connotations in our culture. The connotation of the two combined often leads to dependence and feelings of uselessness far beyond the point of necessity. An able worker can help the blind person and those about him retain his independence.

Financial aid is available for needy blind persons while talking books and a host of other aids, devices and services are provided to those who desire them.

Low Vision Optical Aids

Low vision optical aids and devices are becoming more frequently important in the rehabilitation process. We are anxious to encourage interest in their careful application. These devices do not generally improve total visual efficiency but they frequently convert it to usefulness for specific tasks and activities. We believe that the proper application of low vision aids is a problem which frequently requires interdisciplinary co-operation since the following kinds of information are required to determine the nature of the device needed and predict whether it will be used by the patient. (1) What specific tasks does the visually handicapped person wish to perform and is he correct in assuming that inability to see is the inhibitor of his performance? (2) Are his specific interests sustained or are they likely to be transitory? (3) Does he have both the abilities to use the device properly and to accomplish the tasks in which he is interested? (4) Does he have the motivation and stability to tolerate the inconvenience and frustration associated with caring for, keeping track of and using the additional device, (5) Does he have the self-sufficiency to use the device in the presence of others without undue sensitivity or embarrassment? Low vision aids, that is, magnification or other corrections prescribed in amounts and for distances to permit or facilitate the performance of specific rather than general and customary tasks find their most successful application in (1) the solution of vocational problems, (2) their use with more mature children in classroom work and study and (3) their assistance to persons with strong specific avocational and personal activity interests.

Summary

During the last two and three decades we have moved toward vocational specialization at an ever increasing pace. It is obvious in the professions that this is so. It is also apparent that it is true of nearly every facet of vocational endeavor and has come to typify the character of our existence. This is fraught with vast significance for the person who must live with an impairment because it means that by pre-selecting those areas of activity in which his disability will not inhibit severely his productive effort, he may live and he may compete successfully with the non-handicapped person. We live in a fast moving, fluid, changing world. New

ideas are readily accepted. Opportunity to bring the hope of rehabilitation and satisfying life experience to each blind person is greater than it has ever been. We need to look to this task with the knowledge that it is urgent so that we grasp it while it is with us. Our challenging problem is to change and change rapidly the expectancy role for blind persons in our culture.

Although we may look toward efforts at public education to help, the greatest impact will be made as more and more blind persons function competently and effectively and constantly relate to other men. Anyone who has known personally just one effective, productive, comfortable blind person soon loses the inhibitance to his acceptance. He soon ceases to see the single characteristic of blindness as a pervading mark of identification. We have said that society is more ready and more able, for very practical reasons, to assimilate disabled persons than it has ever been. But there is a great chasm that divides the inhibition, the rejection, the depressing pity and benevolence and the strange rationalization of the past from the possibility of the future. The physician, psychologist, social worker and educator, even though sight may not be restored, may hold out hope to the parent for his child, to the child for his future, to the adult for a fruitful and satisfying life experience. We may, if we pool our resources, build a bridge of successful rehabilitation through co-ordinated medical, social and vocational treatment.

I want to pay a moment's tribute to Dr. Frank E. Burch who, in his retirement, visited our offices a number of times in the continuing pursuit of his interest and study of the productive rehabilitative capacities of visually handicapped persons.

I would recognize, too, Dr. Charles E. Stanford whose contribution as consulting ophthalmologist for State Services for the Blind since 1937 has been of substantial significance in the development of a carefully conceived, sound state program. We shall miss Dr. Stanford in his retirement.

We are appreciative of the efforts of Dr. Hugh Monahan, Chairman of the Academy meeting when these papers were first presented, and who serves as consultant ophthalmologist for the Division of Special Education. His work in both glaucoma and pre-school screening, along with the many other ophthalmologists who are contributing beyond the requirements of their practice, to the improvement of the visually handicapped people of our state is widely appreciated.

A word of friendly gratitude to Drs. William Wenner and Joseph Gaida, both of whom I have seen peering at me from the other end of an ophthalmoscope many times.

It is possible that physicians may wish to pursue our subject further. A recent publication, "The Role of the Ophthalmologist in the Rehabilitation of Blind Patients," published by the American Foundation for the Blind, 15 West 16th Street, New York 11, New York, is the report of a survey of ophthalmologists' opinions and practices relative to their outlook for the blind patient, their advice to him and their referral of him for other forms of rehabilitative assistance.

A study entitled "Rehabilitation Resources in Minnesota," sponsored by State Services for the Blind and the State Division of Vocational Rehabilitation, at the request of the Governor's Committee on Vocational Rehabilitation, will be released shortly. Each practicing physician in Minnesota will be supplied a copy of this handbook to rehabilitation services for impaired persons.

Substantial material relating to the problems of children and parents, the adjustment of blind persons, vocational rehabilitation and prevention of blindness is available upon request through State Services for the Blind, 117 University Avenue, St. Paul 1, Minnesota.

It is with both hope and confidence that we look to a future in which blindness will represent to the individual and to society only the personal inconvenience which, by its nature, it is. This will be true when we have forgotten the limiting barriers which the ages have built of unreality and misconception. In the light of today's perceptions and the efforts of the disciplines toward co-ordinating their human problem solving skills, new opportunity for life fulfillment should come to ever increasing numbers of impaired persons within our generation.

References

1. Ralph G. Hurlin: Estimated prevalence of blindness in the United States. American Foundation for the Blind, Inc.
2. Impairments, by type, sex and age. United States Public Health Service Publication No. 584.B9, July 1957-June 1958.
3. Minnesota studies in vocational rehabilitation: VI. A survey of the physically handicapped in Minnesota. Bulletin 26, December, 1958.

A Continuum of Educational Services for Visually Impaired Children

Pediatric eyesight is not "normal," "visually impaired" or "blind." There is a continuum of disability requiring a continuum of educational services for the disabled child. Segregated programs have given way to integrated co-operative programs. Present-day guidance is for true rehabilitation, often using itinerant special teachers.

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IN TRACING the evolution of educational services for visually impaired children, from its original "segregated" nature through the most sophisticated of the present combined resource and itinerant types of services, it is necessary to speak of both strengths and weaknesses of each stage; surely, the past and all its experiences has provided those of us working in the present with many of the foundations of our existing culture.

As a preface, permit me to correct several misconceptions.

First, the medical profession has shown us that there are few instances in which we, as educators, may literally help to "save sight." Therefore, I will not speak of programs of "sight-saving," but rather, of educational programs for visually impaired children.

Second, educators of such children have found repeatedly that the amount of special service required by a child is not necessarily proportionate to or dependent upon the extent of the visual impairment. We maintain that the programming needs of a child are not described by a medical diagnosis and statement of distance vision alone. One child considered legally blind may read regular print in regular books and enjoy almost identical academic pursuits as his classmates with "average" vision. Another child considered legally blind may require instruction through braille and other tactual media provided by a specially trained teacher. And it is increasingly apparent that the interrelated, variable, and dynamic nature of extent of disability in relation to extent of impairment is so complex that no single discipline can possibly evaluate and/or establish appropriate programs of service.

Third, many educational programs are classified as "classes for the blind," or "classes for the partially seeing." This seems to be too gross an approach to highly individualized pupil needs. To be sure, there are varying kinds and amounts of service, but continued dichotomy between blindness and partial sight clouds the issue of individual difference. Failure to recognize loss of vision as a broad continuum, as merely one dimension to be considered in the over-all measurement of the extent of disability, is to foster gross, inaccurate, and damaging concepts—for educators, for laymen, for family, and of greatest import, for the child.

I will discuss, therefore, programs of educational service to "visually impaired," rather than classes for "sight-saving," and I will refer to the "continuum of visual impairment," rather than to the "blind" or to the "partially seeing." We must necessarily accept arbitrary determinations of disability for legal and other purposes. At the same time, we must in every way encourage the development of a philosophy—a cultural attitude—in which a child with a visual impairment may fall at a place along the continuum of disability, not by acuity alone, not by legal definition, not by stereotyped or arbitrary labels such as "braille reader" or "clear-type reader," but rather, in a multi-dimensional manner which reflects a greater

degree of understanding and professional sophistication than existed a century ago.

Historical Development

One of the first methods of meeting the educational needs of visually impaired children was the *segregated* program. Limited experience and cultural responses to visually impaired individuals over one hundred years ago compelled well intended persons to move the children together—and often away. There can be no question that such a method was a major step forward in recognizing that the children were responsive to education. It was the first, and will always remain a most significant, landmark in the evolution of educational services.

The development of segregated programs for visually impaired had parallels in the development of "institutional" types of programs for children with other disabilities. Because the development of segregated programs for auditorily impaired children approximated the development of programs for visually impaired children in time, for example, many misconceptions about similarities in educational methodology developed, and remain with us yet. It is harmful and inappropriate to generalize about special needs of "handicapped" children.

The end of the nineteenth century brought more recognition of the varying needs of each child, culminating in some excellent research in child growth and development around the early years of the twentieth century. At that time, the "segregated" or institutional type of program made serious and well intended efforts to modify its program, to bring its children into closer contact with "society."

The segregated program still exists as one of a variety of services in some states; it remains as the sole method of service in others; and it has been rarely used in still others. It would be unrealistic to assume that a total program of education services to visually impaired children could exist without the contribution which can be made by segregated programs under highly individualized and often unique circumstances.

As general educational procedures gradually changed, our conception of the handicapped child in the regular school program changed as well. Educational research and refined teaching skills, medical research and improved medical services gave impetus to the changing cultural reactions toward the visually impaired child. Educators sensed their responsibility, along with other professional groups, to do all possible to eliminate or reduce the limiting self-misconceptions of the handicapped individual. Measurement techniques and our ability to compile and interpret data continued to improve so that highly individualized educational programming for all children, with or without remarkable disability, became the American creed.

As early as 1919, three of Minnesota's major cities were reacting to the change in public understanding. Typically, demography played a role in the development of special services. Several eastern cities had demonstrated conclusively that with a sufficient population of children in a specific disability area, local programs could be developed, retaining the advantages of permitting a child to remain in his own community and of growing up knowing his sighted peers with whom he would ultimately share civic responsibility. The integrated *co-operative* program was initiated. This program, in which the child identifies with the special teacher, in which the special room serves as his homeroom and from which his daily education plans stem, also has some advantages under highly individual circumstances.

Early criticism of this type of program had some foundation. It was true that the children were merely attending smaller "segregated" programs, but greater opportunity for observation within the community aided in the increased recognition of similarities rather than differences between visually impaired and sighted children. It seemed less and less logical to provide parallel but non-integrated educational classes. Why should visually impaired students remain separate from their sighted peers if each could profit from similar, if not duplicate, educational experiences?

As new co-operative programs were initiated, there was increased emphasis on the extent to which the handicapped child was "permitted" to participate with the sighted child. Eventually, there were over a half dozen cities in Minnesota in which the visually impaired child might remain at home while acquiring an education which was essentially a duplicate of and was provided as frequently as possible with his sighted counterpart. Ability to integrate, however, was sometimes based on criteria or behavioral phenomena which were not necessarily related to visual disability, *per se*. Too frequently, the extent of participation with the regular class was dependent upon the attitude

of the regular classroom teacher—the visually impaired child being admitted merely as a "visitor" rather than a regular member of the class.

The semi-integrated, or co-operative, plan remains today in several of our cities. For many children, however, it still leaves something to be desired. The Department of Education, though it recognizes the nature of program change and appreciates the administrative time required to adjust programs for individuals, nevertheless holds that this type of program establishes or fosters child-community relationships which are totally incompatible with our philosophy of child growth and development and are not necessarily in the best interests of most children. For a few, this type of dependency relationship with a special teacher is a necessary developmental phenomenon; for many, from the very beginning of their education, it is a stifling and unnecessary self-concept distorting process. We are becoming increasingly aware that the extent to which a child with a visual impairment can be made independent will be in a sense a measure of his possible effectiveness in meeting the exigencies of life.

One major weakness in the co-operative program has nagged at the conscience of the special educator for many years. This system deprived the regular classroom teacher of an opportunity to know the visually impaired child as a full time member of our society, to recognize that he must be brought up together with non-handicapped children at all times, not merely when convenient. To eat together or to sing together were simple, acknowledged achievements; but learning to read seemed to be a completely separate thing. Too few regular classroom teachers have had the privilege of discovering that the child who must learn to read with braille books experiences the same developmental reading process as the child who reads print. The primary difference, of course, lies in the nature of the instructional material and not within the child or in his learning process. All things being equal, braille reading provides no major mysteries for a child who needs this method. In other words, we know from our experience that the child with impaired vision cannot summarily be placed upon a special continuum or special dimension of learning processes or of development of ego strength, or of "growing up" in general.

Teachers of co-operative programs were among those who recognized the tremendous advantages of having a child with a visual impairment placed with the regular teacher and with sighted children for increasing amounts of time during the school day.

As the child's opportunity for integrated socialization experiences increased, educators came closer to an understanding and a possible resolution of one of the major problems—of reducing the tendency toward development of feelings of dependence, and substituting feelings of independence. A child who oscillates daily between two cultural frameworks cannot be expected to achieve the same degree of independence and self care as a child who is introduced immediately and continuously into a real situation in which existing cultural attitudes are reflected and can be immediately interpreted.

We have seen thus far that there are elements of a segregated type of experience which, for selected purposes, may meet a very real need. In addition, we find that the co-operative program, which developed as a result of the parental desires to retain the family unit, has enabled school districts to meet additional requirements of visually impaired students. Such programming, while an improvement over very early efforts, was not the final answer.

Recognition of many of the problems of previous programs precipitated the development of the *resource plan,* which is a fully integrated program. In this system, the child's program is planned co-operatively between his regular classroom teacher and the specialist who is available when needed to present technical assistance and instruction. The resource plan has become increasingly popular and at present is one of the acceptable methods of programming for children with visual impairments in the state of Minnesota.

The regular classroom teacher understands that the education of the visually impaired pupil is as much her responsibility as is each of the other children assigned to her room. In addition, the talents and skills of a highly trained special teacher who is competent in all areas of instruction, who is able to instruct in braille, typing, use of slate and stylus, and who is familiar with other special devices and apparatus which are peculiar to the academic pursuits of visually impaired, are made available. The specialist provides such instruction not as the one who maintains foremost responsibility for such children but as a "resource" to the regular classroom teacher and the child.

The major strength in this program is obvious. A significant and continuing opportunity exists for the visually impaired child to develop a major identification with his sighted peers. As this is achieved, we see dramatic differences in the manner in which he reflects his growing confidence. We note his self-concepts developing with a minimum of distortion and dependency. We find at the same time that within this framework it is quite easy and acceptable for a child with special need to draw a parallel between himself and another child in his room who may require the special services of the speech correctionist, or another child who is being seen by an itinerant teacher of lip reading and auditory training. Furthermore, it is reasonable and not unique for him to excuse himself from the classroom on a definite schedule, or perhaps under certain circumstances at his own discretion, to seek out support or special information or to use some special tangible apparatus which he may require in order to independently pursue his studies. There is an advantage in placing resource rooms and resource teachers in carefully selected elementary buildings throughout a school district. In this manner a greater number of visually impaired children can come to the building which would ordinarily service their educational needs were they not handicapped.

The need for special instruction is greater during the primary grades, in contrast to a greater need for unique dimensional equipment and experience as the pupil grows older. Such a change is essentially in the nature, rather than in the amount, of special help.

The junior high school pupil is generally competent in such things as use of slate and stylus, typewriting, use of the braille writer, and has the ability to understand and use the braille code effectively for most reading purposes. The major contribution of the special teacher at this time lies not so much in actual participation with the child in developing skills as with the preparation of materials which enhance the task of the regular classroom teacher as she fulfills her responsibility in educating the visually impaired child.

By the time he is in a junior high school program, the disabled child may function quite independently, but will continue to require access to bulky reading and reference material and/or tangible apparatus such as tape recorders, regular typewriters, braille writers, et cetera. If the student is adequately prepared and sufficiently independent in study skills, however, he may require only occasional, rather than constant, special teacher services. The special teacher might visit the child's school on a definite schedule, or perhaps be available on call, moving from building to building within a school district or among several school districts. This type of special education service is called the *itinerant program.*

In several cities in Minnesota we presently find a resource room in the primary grades coupled with an itinerant type of service on the junior and senior high school level. A combination of several "types" of programs within a small school population imposes a tremendous responsibility upon the special teacher. She must arrange her schedule so that she brings service to a child at an appropriate time with minimum interruption of his regular school activities. The efforts thus far have been rewarding, and we anticipate an increase in this kind of service as the greatest number of the retrolental fibroplasias move out of the primary grades into the junior high school level.

The stereotyped "handicapped child" of a hundred, fifty, or even twenty-five years ago has become an illusion. No single discipline, no single corrective method, no single type of education program can possibly be equally appropriate for all visually impaired pupils.

I have presented some of the strengths and weaknesses of the various educational programs for services to visually impaired children in their developmental sequence. It would be as undesirable to say that everything was wrong in the beginning as it would be to suggest that everything is perfect now.

The positive elements of the *segregated, cooperative, resource,* and *itinerant* services must each be molded into a total comprehensive program which is sufficiently flexible to meet the needs of every visually impaired child regardless of where he falls on the continuum of disability. The dynamics of behavior are no longer mere postulates; they are fact. If we accept this we must also provide for the changing needs of an individual child in addition to the variety of needs of many children. The development of educational programming which meets every child's needs in relation to the community is a privilege which is accompanied by tremendous responsibility—not for the educator alone, but for the entire team of specialists.

Metastatic Malignant Melanoma Involving Both Ovaries

Report of a Case

Although a variety of metastatic tumors invade the ovary rather frequently, the appearance of ovarian metastasis from a malignant melanoma is extremely rare. The pelvic metastatic tumors in this case did not appear until seven years after removal of the primary lesion, which was on the leg. The malignant cells apparently reached the ovary by retrograde lymphatic permeation.

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DECISION to report the following case was stimulated by encountering a patient who had metastatic malignant melanoma involving both ovaries seven years after removal of the primary lesion. The literature concerning metastatic ovarian cancer is replete with reports dealing principally with Krukenberg's tumors, which originate from the upper part of the gastrointestinal tract. In a survey at the Mayo Clinic of surgical cases seen from 1939 through 1949, a total of fifty-nine of 531 ovarian tumors (11 per cent) proved to be metastatic; only 20 per cent of these fifty-nine cases represented the Krukenberg lesion.[1] More recently, the percentage of metastatic ovarian neoplasms has increased appreciably owing to the advent of oöphorectomy in the palliative treatment of advanced mammary carcinoma. Unilateral or bilateral ovarian involvement has been found in more than 40 per cent of this group of patients whose ovaries have been subjected to careful microscopic scrutiny.

None of the surgically resected metastatic ovarian tumors observed in the afore-mentioned period were melanomas, and necropsy studies on eleven of our patients with generalized malignant melanomatosis have not revealed any instances of secondary ovarian involvement.

The literature likewise attests to the rarity of metastatic ovarian melanomas. Basso,[2] in 1908, was able to find only five examples in addition to one he reported. Since that time five similar cases have been reported.[3-7] In two of these five cases, the primary lesions were in the eye. In several instances, the ovarian tumors were thought to be the primary lesions until necropsy disclosed their metastatic nature.

Report of Case

A thirty-nine-year-old white woman (gravida IV, Para II) entered the hospital in August 1959, with a history of "lumps" in the left scapular region and in the left side of the neck for one and four months, respectively. She had been in good health except for recent complaints of lower abdominal cramps associated with two to eight loose bowel movements per day. These cramps were relieved by the bowel movements.

Wide excision of a pigmented mole from the calf of the left leg had been done in February 1952, after the birth of her second child. This mole was discovered during

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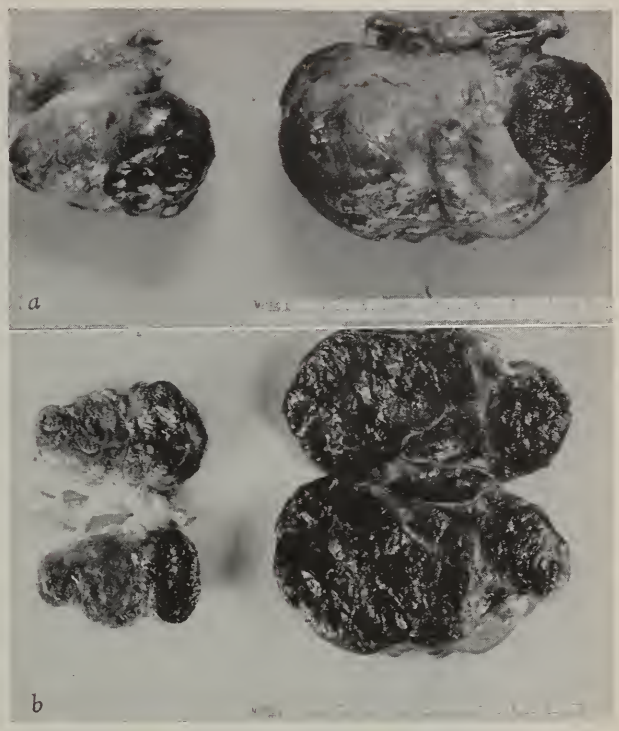


Fig. 1. Bilateral ovarian involvement by metastatic malignant melanoma. *a*. Note the bosselated surfaces of the tumors, with varying shades of color. *b*. Cut surfaces of tumors, featuring dark color and nodularity.

routine postpartum examination. The defect was covered by a skin graft. Pathologic examination revealed a malignant melanoma measuring 1.5 by 1.5 by 0.3 cm. Four days later, prophylactic dissection of the left inguinal nodes was done. The nodes were not involved metastatically. In November 1952, an intradermal nevus was excised from the left scapular region, and a junctional nevus was removed from the right scapular zone. Dilation and curettage were performed in July 1953, for an incomplete abortion. No further trouble ensued until 1958, at which time cholecystectomy was done for gallstones. This operation was done at the clinic; the surgical notes, dated December 5, 1958, mentioned some enlargement of the left external iliac nodes, but the ovaries were described as being normal.

Examination in August 1959, disclosed a 7-mm., dark, raised, rounded cutaneous lesion on the posterior aspect of the left scapular region and two palpably enlarged lymph nodes in the left supraclavicular zone. Pelvic examination delineated a round mass in the cul-de-sac, separate from the uterus, and a flat firm mass along the left pelvic wall. These masses were ascertained to be extrarectal on proctoscopy.

The results of urinalysis and the values for hemoglobin, leukocytes, the differential count, platelets, prothrombin time, coagulation time, and the erythrocytic sedimentation rate were normal. Roentgenograms of the thorax revealed linear fibrosis at the right base, with elevation of the right hemidiaphragm. The pelvic findings and the past history appeared to be consistent with the diagnosis of a pelvic malignant tumor.

The abdomen was explored through a primary lower midline incision. Both ovaries were the seat of large, dark, nodular, solid tumors. Bilateral salpingo-oöphorectomy was performed. There were no peritoneal implants, and the liver, spleen, and kidneys were normal to palpation. Bilateral involvement of the iliac and aortic nodes up to the level of the pancreas made dissection of the nodes inadvisable. It was thought that the enlarged supraclavicular nodes likewise represented metastasis. Excisional biopsy of the cutaneous lesion near the left scapula was done.

The patient subsequently received nitrogen mustard therapy. She died from complications of the primary disease in November 1959. Necropsy revealed metastatic melanoma of the meninges, skull, liver, spleen, lungs, bones, and lymph nodes. Myocardial hemorrhage and infarcts in the basal nuclei of the brain were present.

Pathologic Features

Both ovaries were replaced grossly by nodules of tumor (Fig. 1*a*). The right ovary weighed 30 gm. and measured 4 by 3 by 3 cm.; the left one weighed 75 gm. and measured 8 by 5 by 5 cm. The tumors were encapsulated, nodular and solid, with colors ranging from dark gray to sooty black. The cut surfaces disclosed that the growths were solid throughout and were transected by fibrous bands, resulting in compartmentation of the tumors into aggregates of nodules of varying sizes (Fig. 1*b*). The fallopian tubes were normal in gross appearance. The lesion near the left scapula consisted of a dark subcutaneous nodule 1 cm. in diameter suggestive of metastatic malignant melanoma.

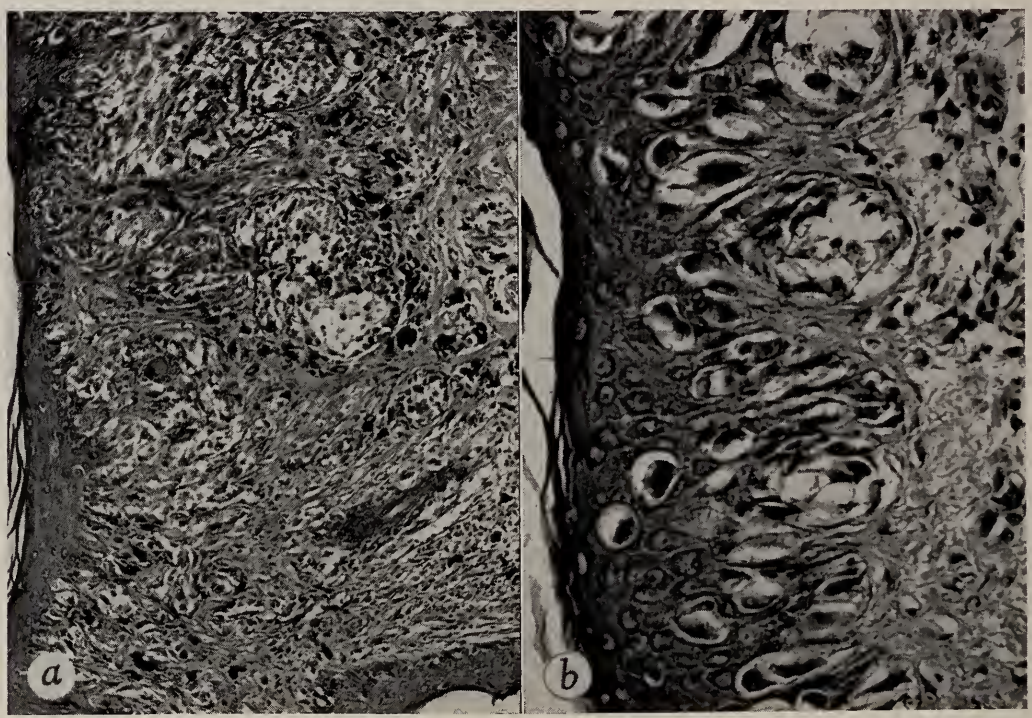


Fig. 2. Primary cutaneous tumor. *a*. Note pigmentation and deep invasion of lymphatic spaces (hematoxylin and eosin; x100). *b*. Growing edge of primary tumor, showing giant malignant melanoblasts in "junctional" position (hematoxylin and eosin; x300).

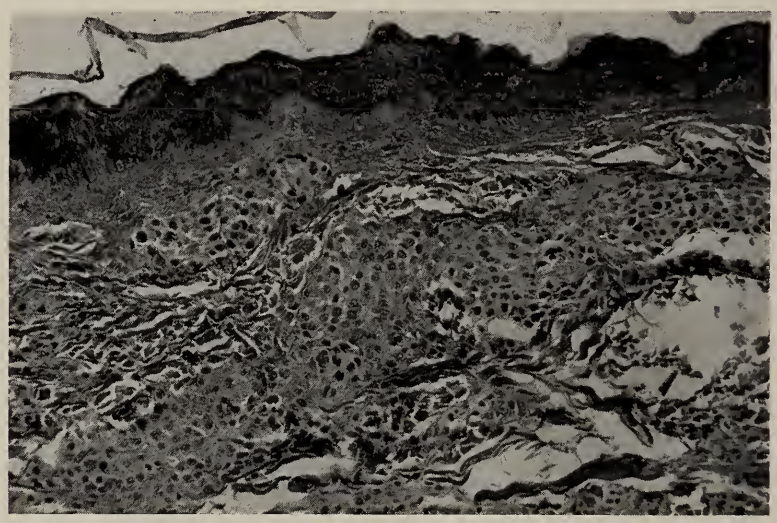


Fig. 3. Metastatic cutaneous lesion near scapula, showing characteristic subepithelial position of clusters of metastatic melanomatous cells (hematoxylin and eosin; x100).

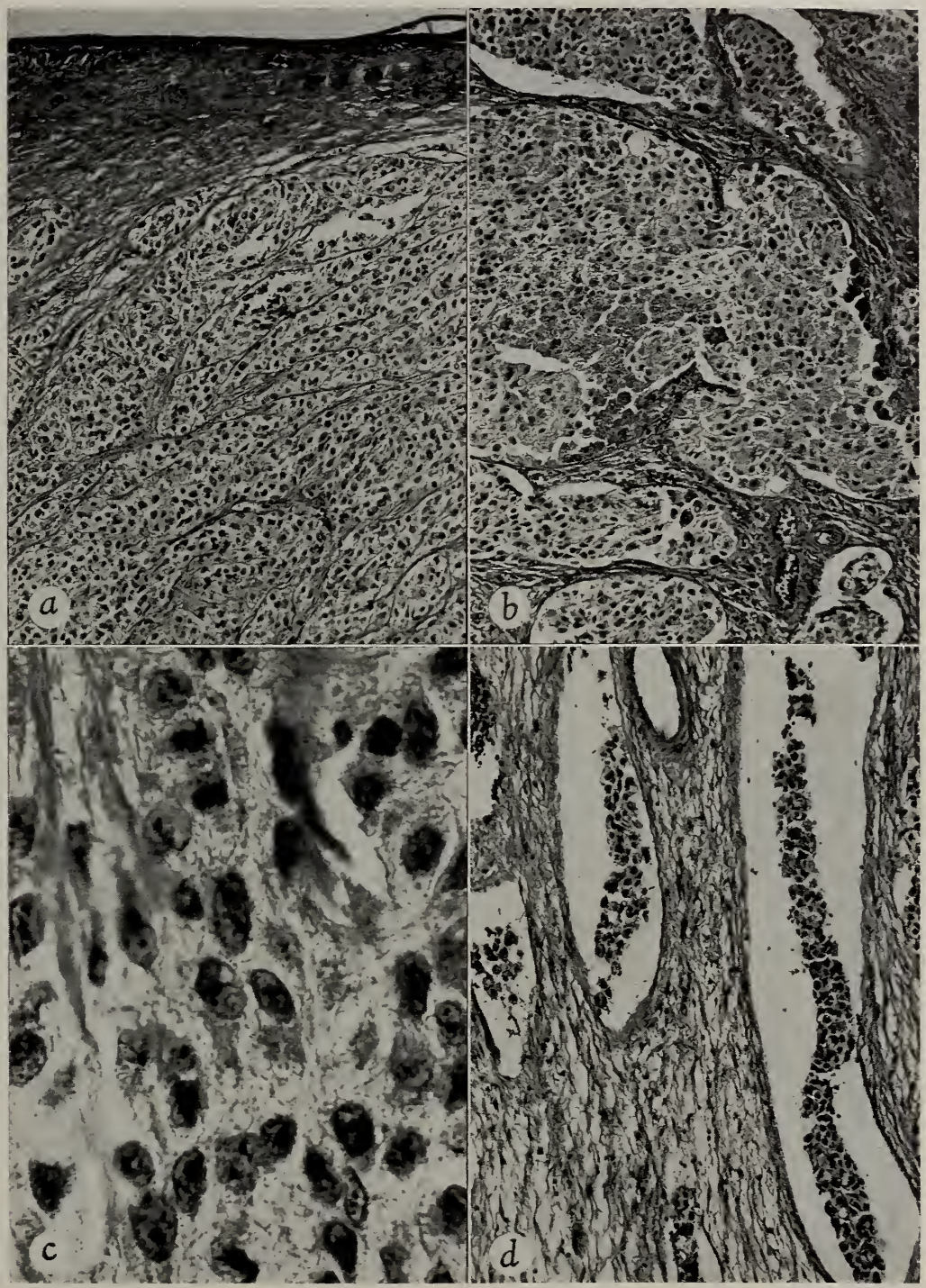


Fig. 4. *a*. Right ovary, showing masses of malignant melanoma growing beneath uninvolved rind of "capsular" ovarian cortex (hematoxylin and eosin; x100). *b*. Sheets and alveolar clusters of large granular tumor cells lend an epithelial flavor to nodule from left ovary (hematoxylin and eosin; x100). *c*. Right ovary, showing zone in which tumor cells have assumed spindle shapes. A mitotic figure appears in the upper part (hematoxylin and eosin; x600). *d*. Both ovarian hili exhibited lymphatic plugging by tumor cells to suggest lymphogenous spread to ovaries (hematoxylin and eosin; x100).

Sections of the primary tumor that had been removed in 1952 showed a typical malignant melanoma, with anaplastic melanoblasts present superficially in a junctional position and involving lymphatic structures more deeply (Fig. 2). A large amount of melanin was present. The metastatic nodule from the scapular zone contained clusters of malignant melanoblasts beneath the epidermis, as is typical for metastatic cutaneous lesions of this type (Fig. 3).

Except for an identifiable uninvolved rind of capsular cortex (Fig. 4*a*), the ovaries were replaced completely by large, granular, melanin-containing, epithelial-like tumor cells arranged for the most part in sheets and alveolar clusters (Fig. 4*b*). Occasional spindling was noted, which is a fairly common variation from the usual polygonal form of melanoma cells (Fig. 4*c*). Perhaps the most arresting feature in both ovaries was the plugging of almost all of the ovarian hilar lymphatic vessels with masses of tumor cells (Fig. 4*d*), a feature that strongly suggested a lymphatic pathway for involvement of the ovaries in this case.

Comment

The clinical features of interest in this case included the long latent period between the removal of the primary tumor and the appearance of the metastatic ovarian lesions. Although the pelvic nodes were enlarged at the time of cholecystectomy, in 1958, direct palpation of the ovaries at that time did not disclose any gross involvement. It is rather paradoxic that malignant melanomas, which are considered to be among the most aggressive of all malignant neoplasms, frequently give rise to metastatic lesions that may remain clinically quiescent for ten years or more.

Pathologically, it is intriguing that the ovary, which so frequently plays host to lesions of a lower order of malignancy, so rarely should be the site of metastatic malignant melanoma. Yet in this case, the liver, kidneys, and other visceral "favored" sites of metastasis apparently were bypassed for the selection of both ovaries for establishment of the principal secondary sites of spread.

With respect to the pathogenesis of the ovarian involvement, the absence of ascitic fluid, the absence of tumor cells in the superficial zones of the ovarian cortex, and the lack of involvement of ovarian hilar blood vessels were unusual features. Retrograde lymphatic permeation apparently was the method by which the tumor cells reached their ovarian destination in this case. The surgical verification of extensive nodal involvement is pertinent in this regard. Eventual spillage into the blood vascular system, probably via the thoracic duct, was indicated by the presence of the subscapular tumor, whose existence could not well be explained except on the basis of dissemination through the pulmonary vascular filter.

The presence of such neoplasms practically always implies a fatal outcome, the average postoperative survival in two large series of metastatic ovarian tumors being 4 months[8] and 11.1 months,[1] respectively. When encountered at laparotomy, these ovarian metastatic tumors, along with the tubes, should be removed to prevent such complications as twisting of the pedicle and ascites. A short period of comfort may be expected to ensue.

Summary

Although metastatic ovarian neoplasms are relatively frequent, metastatic malignant ovarian melanoma is exceedingly rare. A case has been reported in which the primary lesion was excised radically from the calf of the left leg seven years before the appearance of large solid metastatic tumors in both ovaries and in the skin near the left scapula. The patient lived for five months after the pelvic operation.

References

1. Smith, P. L.: Ovarian Carcinoma of Metastatic Origin. Thesis, Graduate School, University of Minnesota, 1950.
2. Basso, G. L.: Sul sarcoma melanotico dell' ovaio. Ginecologia, 5:257, 1908.
3. Broders, A. C., and MacCarty, W. C.: Melanoepithelioma: A report of seventy cases. Surg., Gynec. & Obst., 23:28 (July) 1916.
4. Dawson, H. G. W.: Quoted by Miller.[6]
5. Ganse, R.: Einseitige Metastase des Ovarium eines Chromatophorom der Haut unter den Symptomen eines stielgedrehten Ovarialtumor. Zentralbl. Gynäk., 77:1146, 1955.
6. Miller, J. R.: Melanoma (melanotic sarcoma) of the ovary with diffuse discoloration of the skin. New England J. Med., 199:830 (Oct. 25) 1928.
7. Nowak, Ignaz: Kritischer Beitrag zum primären Melanosarkom des Ovariums. Arch. Gynäk., 112: 183, 1920.
8. Diddle, A. W.: Krukenberg tumors: Diagnostic problem. Cancer, 8:1026 (Sept.-Oct.) 1955.

Editorials

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DIAGNOSTIC CRITERIA FOR RHEUMATOID ARTHRITIS

In 1956, a committee* of the American Rheumatism Association was appointed to formulate criteria for inclusion of a given case as rheumatoid arthritis in any study of the disease. This was thought to be necessary since an etiological classification is impossible at the present time; there is a lack of specific therapy which might serve as a basis for classification, or "therapeutic test"—for instance, colchicine in gout; there is uncertainty of identification in early and mild cases; atypical instances occur which later develop classical symptoms; there is a multiplicity of systemic diseases in which there are joint symptoms; and there is need of a common base line for comparing series of cases reported from diverse sources as to incidence, prevalence, course, treatment, and other features. There is also need for a category to include doubtful cases to be followed, but not to be included in present reports of series of rheumatoid arthritis. It is the plan of the committee to review the criteria every two or three years. The last review was in 1958.

The criteria were selected after consulting the Pittsburgh epidemiological study†, and questionnaires completed by physicians in the United States and Canada interested in arthritis. Signs and symptoms of rheumatoid arthritis which are nonspecific were discarded, such as fatigue, weight loss, anorexia, fever, lymphadenopathy, anemia, leukocytosis, leukopenia. Also discarded were signs of musculo-skeletal inflammation, such as tenosynovitis, muscle atrophy, skin atrophy. Conditions found to be of little value in diagnosis were eliminated, such as vasomotor symptoms, pericarditis, myocarditis, pleurisy, and reversed A/G ratio.

The following, in outline form, is the classification determined, together with a list of diseases, the presence of which was regarded as excluding such a case from a study of rheumatoid arthritis.

I. Rheumatoid Arthritis

A. *Classical Rheumatoid Arthritis.*—This diagnosis requires seven of the following criteria; duration of criteria (1) through (5) must be continuous for at least six weeks.

(1) Morning stiffness.

(2) Pain on motion or tenderness in at least one joint (observed by a physician).

(3) Swelling, soft tissue thickening or fluid (not just bony overgrowth), in at least one joint, observed by a physician.

(4) Swelling (observed by a physician) of at least one other joint. Any interval free of joint symptoms between the two involvements may not be more than three months.

(5) Symmetrical joint swelling (observed by a physician) with simultaneous involvement of the same joint on both sides of the body. (Bilateral involvement of mid-phalangeal, metacarpophalangeal or metatarso-phalangeal joints is acceptable without absolute symmetry. Terminal phalangeal joint involvement will not satisfy this criterion.)

(6) Subcutaneous nodules, observed by a physician, over bony prominences, on extensor surfaces or in juxta-articular regions.

(7) X-ray changes typical of rheumatoid arthritis, which must include at least bony decalcification localized to, or greatest around the involved joints and not just degenerative changes. Degenerative changes do not exclude patient from the group of rheumatoid arthritis.

(8) Positive agglutination test—demonstration of the "rheumatoid factor" by any method which, in two laboratories, has been positive in not over 5 per cent of normal controls—or positive streptococcal agglutination test.

(9) Poor mucin precipitated from synovial fluid with shreds and cloudy solution. (Addition of acetic acid gives a fat clump in a clear fluid in normal synovial fluid.)

(10) Characteristic histologic changes in synovial membrane with three or more of the following: marked villous hypertrophy; proliferation of superficial synovial cells often with palisading; marked infiltration of chronic inflammatory cells (lymphocytes or plasma cells predominating) with tendency to form "lymphoid nodules"; deposition of compact fibrin, either on surface or interstitially; foci of cell necrosis.

(11) Characteristic histologic changes in nodules showing granulomatous foci with central zones of cell necrosis, surrounded by proliferated fixed cells, and peripheral fibrosis and chronic inflammatory cell infiltration, predominantly perivascular.

B. *Definite Rheumatoid Arthritis.*—Requires five of the above criteria: Criteria (1) through (5) should have duration of at least six weeks continuously.

C. *Probable Rheumatoid Arthritis.*—Requires three of above criteria; in at least one of criteria (1) through (5), continuous presence for at least six weeks.

D. *Possible Rheumatoid Arthritis.*—Two of the following and total duration of joint symptoms of at least three weeks: (1) morning stiffness, (2) tenderness or pain on motion (observed by physician), (3) history or observation of joint swelling, (4) subcutaneous nodules (observed by a physician), (5) elevated sedimentation or C-reactive protein, (6) iritis.

*The American Rheumatism Association committee is: Marian Ropes, M.D., chairman, Granville Bennett, M.D., Sidney Cobb, M.D., Ralph Jacox, M.D., and Ralph Jessar, M.D. Published in part in *The Bulletin* (ARA).

†Cobb, S., et al: J. Chronic Dis., 2:50, 1955 and 3:134, 1956.

II. Exclusions

1. High concentration of L-E cells (four or more in two smears prepared from heparinized blood incubated not over two hours) or typical rash of L-E.
2. Histological evidence of periarteritis, dermatomyositis, scleroderma, sarcoid, multiple myeloma, tuberculosis in joints or tubercle bacilli in joints, leukemia or lymphoma.
3. Gout
4. Specific infectious arthritis
5. Rheumatic fever
6. Reiter's syndrome
7. Shoulder hand syndrome
8. Hypertrophic pulmonary osteoarthropathy
9. Erythema nodosum
10. Alkaptonuria and ochronosis
11. Agammaglobulinemia
12. Neuroarthropathy

The criteria in the groups designated as *classical* and *definite* rheumatoid arthritis are rigid enough to be as sure as possible that all cases included are truly examples of rheumatoid arthritis. This is essential because patients in these categories will be used for study of disease, and as a basis for figures on prevalence, incidence, course, and therapy. However, they are not so strict that only cases of great severity or long duration should be included. Therefore, the duration was made fairly short—six weeks or more. This minimum duration usually excluded such illnesses as infectious arthritis, traumatic arthritis, and rheumatic fever. Also as small a number of affected joints were required as possible; only one at a time if other laboratory or clinical evidence was present.

It is important not to exclude a patient who has rheumatoid arthritis because he also has degenerative joint disease, an error that is commonly made. Uncomplicated degenerative joint disease is excluded by the rigid criteria stated for rheumatoid arthritis of soft tissue swelling and symmetry, *not limited to the terminal phalangeal joints,* nodules, and characteristic laboratory findings.

With regard to the exclusions, most are apparent, but it is well to point out that a rheumatoid arthritis patient may be thought to have another generalized connective tissue disease, or gout, or rheumatic fever. It is wise not to include such a patient in a study of rheumatoid arthritis, but to classify him separately and compare as desired. But patients with rheumatoid spondylitis, psoriasis, ulcerative colitis, or juvenile rheumatoid arthritis (onset before age twelve) are to be included in rheumatoid arthritis groups if they satisfy the criteria.

MARIAN TYNDALL, M.D.

A PROFESSION ON THE HORIZON

The traditional professions of law, medicine, education and several others are marked by definable characteristics common to the professions. Thus, members of these groups have (1) successfully completed a formal course of study prior to engaging in "clinical" practice; (2) mastered a specific body of knowledge in addition to technical skills; (3) received approval by members of the professions; (4) been licensed by the state in which they chose to practice; and (5) dedicated their careers to service without regard for personal aggrandizement. It is this final requisite which is the single most important mark of a professional person. It is this which raises him above the skilled technician or the learned craftsman. Also, it is this trait which is manifestly lacking in the non-professional person.

Within the framework of our definition, there are relatively few, if any, men today who might be classified as professional police officers. There does not yet exist any group within the field of law enforcement which has established or which can enforce professional ethical standards. Likewise, there are no established certification procedures beyond the local selection screening processes.

Despite these apparent shortcomings in law enforcement, there is an increasing number of men who may be considered as professional police officers. The completion of a pre-service educational program, mastery of the literature of law enforcement and a clear dedication to public service are traits common to countless men today routinely engaged in the protection of society and in the enforcement of laws.

The test of professionalization is primarily applied at the level of selection-for-appointment. It is here that the unfit, the incompetent and the unstable must be eliminated. It is here that the most rigid requirements must be satisfied.

Experience and wisdom dictate that pre-employment residence requirements be abolished, that intelligence levels above average be required, that psychiatric examinations be mandatory, that candidates be free of criminal experience and associates, and that educational standards be met. That

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these simple and inexpensive selection standards are not universally applied attests to the strength of the political ties which bind the administrator's hands. In each individual case, it is difficult to determine precisely whether the inadequate selection procedures are erected as monuments to ignorance or to selfish political control. In either case, it is a serious indictment of those politicians who first established and who have since perpetuated selection standards that only 10 per cent of American cities employ the psychiatric examination, that some police agencies fail to fingerprint their candidates, and that educational requirements are forbidden by state statute in some areas.

The existence of these negative conditions implies far more that mere cultural lag whereby a social institution lags behind accepted change for a number of years. These conditions indicate that many persons (administrators and politicians alike) are satisfied with the inferior selection standards as they presently exist in many communities. It may be said that the vocal minority who insist upon tight local control over police selection are the same few who benefit so greatly from that control. For example, the mayor who can tear up traffic tickets for his friends, who can have his inebriated companions chauffered home in police cars, and who can reward loyal political chronies with police positions would certainly favor standards far below those recognized as being vital necessities of professional law enforcement. No other requirement is so directly related to politics as the minimum age requirement of the great bulk of departments. Twenty-one years of age is the minimum age for appointment. This requirement is tied directly to the voting age in this country. Rationalizations for this practice in the name of maturity and stability are hollow phrases in view of the military accomplishments of the so-called boys under twenty-one. Law enforcement is one of the few endeavors which refuses to compete in the labor market for the greatest number of men. Thus, police departments frequently are forced to select from those who have spent three or four years out of high school in other jobs or who have remained unemployed. Immediate steps must be taken to find non-crucial positions for high school graduates, positions which can serve as training and as a springboard into regular duty status.

Professionalization to many persons is interpreted to mean a salary approximating that of one of the traditional professions. Many persons become entangled in the circular argument which says that in order to attract good men you must first offer good wages while, on the other hand, good wages should be offered only to good men. This chicken vs. the egg discussion has served to impede rather than hasten professionalization for those police officers who insist that salaries alone will bring about the immediate elevation of standards.

Regardless of which comes first, the salaries or the standards, one thing is clear—professionalization of police service must come from within the ranks of law enforcement. The insistence upon the highest standards for appointment, the demand for pre-service training and the determined refusal to make and share the bed of the local politicians are prerequisites for professional service—prerequisites which must be fostered and developed by police officials.

Throughout any discussion of professionalization must be carried the important thought that every police officer will not become a police chief or an administrator. The majority of men will remain as patrol due to the narrowing pyramid of supervisory positions. Thus, selection procedures and professional standards must be realistic. They must recognize that varying levels of competence and intelligence are needed. But, agreement can be had on the fact that the minimum standards should be high enough to provide communities with intelligent, stable, forthright individuals who can meet the challenge of our complex social and legal system.

Despite the general lack of adequate selection and training procedures throughout this country, many persons are pleasantly surprised to find such a large number of competent and dedicated persons in police work today. Modern police work today is as challenging an endeavor as any to be found. Lacking strict standards on a national scale, a number of departments have grown into truly professional agencies. Certainly, in every department in this nation, there are a number of men who must be labelled as dedicated, for few police salaries could attract and retain persons of their caliber. These are the men who value and cherish the dream of professional status and who have dedicated their own careers as examples of what can be accomplished—and what should be demanded.

George W. O'Conor

President's Letter

WE JOIN THE FIGHT AGAINST FOOD FADDISM

We have been told that Americans annually spend nearly a half-billion dollars on food supplements in pill, powder, capsule or compound form.

Pseudo-nutrition experts are doing an effective job of selling Americans on the idea that their product will provide a shortcut to health.

Common variations on the necessity for food supplement theme include the following: all diseases may be due to diet; soil depletion causes malnutrition; modern food processing and cooking methods reduce food values; and, that "tired feeling" is always due to a dietary deficiency.

Thankfully, most of these dietary supplements are harmless to persons in good health.

How often have we not told our patients that a well-balanced daily diet includes all the nutritional requirements to maintain good health at a fraction of the cost of food supplements. Truly, the educational program of the modern medicine man, his lecture hall and door-to-door diagnostic techniques have made their inroads.

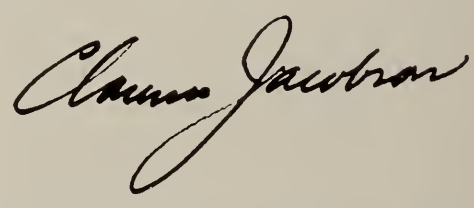
Forceful allies of the medical profession in the fight against food faddism include the U. S. Food and Drug Administration and the Federal Trades Commission. The FDA inspects and assures the purity, wholesomeness and safety of foods sold in interstate commerce; while the FTC places checks on false advertising claims which have been found to be untrue or misleading. In addition, the AMA has prepared an effective Food Faddism Campaign Kit. This is available to county medical societies and individual members from our State Office.

The kit includes program ideas, a sample speech, and samples of public health education literature on food faddism available for distribution to the public. Also included is a descriptive folder of the AMA food faddism film, "The Medicine Man."

At the May 23, 1960, meeting of the Public Health Education Committee, Minnesota physicians were assured of the services of the members of the Minnesota Dietetic Association in a state-wide education program against food faddism. Dietetic Association representatives at that meeting informed members of the Public Health Education Committee that a statewide program to combat food fads and food misinformation has been drawn up by that organization and dietitians throughout the state have been contacted and urged to support the program.

The program, sponsored by the Minnesota Dietetic Association with the support of the Minnesota State Medical Association and the co-operation of the Woman's Auxiliary, will go into operation on September 1, 1960. The program format will include showing of "The Medicine Man." Plans are to have a physician and a dietitian present to introduce the film, explain its purpose and answer dietary questions.

The nutritional quack has spared nothing to tell his story to the public. Can we afford to do less?



President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

"THIS IS THE ELEVENTH HOUR," AMA AUDIENCE TOLD

"There seems to be a widespread dilusion existing today that money coming from Washington, for some strange reason, doesn't cost anybody anything," according to Mr. Chester Lauck, Executive Assistant of the Continental Oil Company of Houston, Texas.

Mr. Lauck, who spoke to AMA Delegates, members of the Board of Trustees and guests at a breakfast sponsored by the Arkansas Medical Society held in conjunction with the 109th Annual Meeting of the American Medical Association, told the group that America is riding the crest of a wave of prosperity never before dreamed of on this earth.

He pointed out that in spite of this prosperity, we suddenly find ourselves 295 billion dollars in debt. We owe more money in this country than all the other nations on earth put together. WHY? Simply because we have been spending more than our income. We have become involved in a deficit spending program for a number of years because people will not realize that the government does not have a stockpile of funds back in Washington which they can dispense or distribute at will.

"Mr. Khrushchev has declared that the Soviet Union no longer expects to defeat the United States on the battlefield of the military but rather has elected to destroy us on the battlefield of economy. They are aiming directly at the strength and stability of our American dollar. It is their hope that we will spend ourselves into bankruptcy and if we continue our deficit spending program, we are aiding and abetting their cause.

"Washington is not entirely at fault. Let's put the blame where it belongs—on ourselves. We have not assumed our responsibility of citizenship. WE ASKED FOR IT. Every project we undertake—whether it is for a rural community, a village, city, county, or state, or whether the project be an overpass, underpass, bridge, airport or even urban renewal—the first question usually asked is 'How much government aid can we get?' It is generally asked without any regard or consideration as to where the funds might be coming from."

The speaker expressed the belief that we have forgotten how to do things for ourselves. We forgot that with grants-in-aid come government controls, and with government controls we cannot embrace the free and competitive enterprise system—the system that brought about this prosperity and made America so outstandingly great.

Someone recently said, "We have been living mighty high on the hog, but it 'ain't' our hog—it belongs to our children." Are we just going to drop this $295,000,000,000 debt in their laps and ask them to scramble out of it the best way they can? Our children and future generations are entitled to inherit this republic as we found it—with freedom and opportunity, intact and unmortgaged.

"Some economists say we are beyond the point of no return. This is hard to believe. We must realize, however, that this is THE ELEVENTH HOUR. We must realize the direction toward which we are drifting and do something about it *NOW*. We have got to concern ourselves with government matters—to get into politics. Too many for too long have been saying, 'I don't know anything about politics; I leave that up to the politicians.' The result is that a handful of people have been running this country. And our $295,000,000,000 debt, socialistic welfare programs, and the present threat against our free and competitive enterprise system indicates quite clearly HOW they have been running it."

Mr. Lauck emphasized that we must begin at the grass roots. In order to accomplish this, he advocated we must attend our local precinct meetings, finding out what candidates for office stand for—not whether they are Democrats or Republicans, but what kind of Democrats, what kind of Republicans. He told the group that we have too many Democratic Congressmen and too many Republican Congressmen in Washington and not enough United States Congressmen.

"It is not too late to put the love of our country above partisanship interests by selecting conserva-

tive candidates for office and then supporting them with all our strength and influence. In this way, and only in this way, can we hope to preserve our Constitution and the American way of life.

"We can and must select men for office who will think of the next generation rather than the next election."

Mr. Lauck stated that now we must prove that we are of the same sturdy stock as were our forefathers by assuming the responsibility of preserving the heritage they willed us. THIS IS THE ELEVENTH HOUR!

The members of the American Medical Association, as individuals, must stand up and be counted and exercise the influence which their position in their community places them, and the American Medical Association must stand as a body to defend our free enterprise system and to ward off the threat of socialized medicine.

There are two things with which we need to be concerned. We need roots to hold us firm and we need sky to hold us up, and in between, a living process. Because, out of our beliefs we perform deeds, and out of our deeds we form habits, and from our habits grow our character, and ON OUR CHARACTER WE BUILD OUR DESTINATION, concluded Mr. Lauck.

REPRESENTATIVE CURTIS RAPS FEDERAL GOVERNMENT INVASION OF MEDICINE

Representative Thomas B. Curtis, a key figure in the House Ways and Means Committee, was the guest speaker at the dinner for Delegates and their wives held in conjunction with the 107th Annual Meeting of the Minnesota State Medical Association.

The ranking Republican on the House Ways and Means Committee, Representative Curtis of Missouri, characterized the main supporters of Forand-type legislation as leaders of the AFL-CIO's Committee on Political Education (COPE) —a body he said represents not the views of organized labor but of the left-wing Americans for Democratic Action, ADA.

COPE, he said, has consistently smeared the AMA as an organization consistently against things, ultra-conservative and always motivated by ulterior motives. "It's been a clever smear job," he said.

Supporters of the Forand Bill almost won the case, he said, before it came before Congress, by phrasing its argument with an innuendo that the government now does nothing in the field of health care for the aged. There is plenty of help coming from the federal government now, he said.

Phony Statistics

The congressman cited "phony statistics" used by supporters of the bill, such as "51 per cent of those over sixty-five have an income of $1,000 per year or less." That figure, broken down into what he called meaningful figures reads that 34 per cent of the men and 71 per cent of the women over sixty-five are in that income group. This argument loses some of its urgency, he said, because men are generally the breadwinners.

Other examples include the statement that costs of health are greater after sixty-five than before. This is true only in the case of medical costs. Food, clothing and all other living costs are decreased, he said.

The Forand Bill, he charged, doesn't help those who really need assistance. Widows of farmers, businessmen and other members of the economic community not covered at the time of death, will not be eligible for help.

Also not covered is the victim of the "catastrophic illness"—the cost of which could wipe out savings of a lifetime.

Such a program, he said, would necessarily result in socialized medicine. The government, he said, rather than the patient, would be the one which would ultimately have to choose the physician.

Blue Cross and similar health insurance plans, he said, now cover nearly half of the people in America. The figure is expected to jump this year. Insurance is now available for those over sixty-five at premiums which range from $55 to $140 a year, he said.

He also cited AMA testimony at hearings earlier this year in which doctors claimed there is "no one in the United States, regardless of his financial condition, who can't get adequate medical care."

Help Pay Premiums

Representative Curtis said he is in favor of looking into legislation which would help pay premiums for health insurance by private companies; extending coverage to pay for nursing home care and home care, which would be less expensive. Above all, he said, more public hearings should be held to determine the best legislation possible.

AUBREY GATES URGES GREATER MD POLITICAL ACTION

The Director of Field Services for the American Medical Association, Mr. Aubrey Gates, who preceded Representative Curtis on the speaker's platform at the delegates dinner, urged doctors themselves to take the lead in fighting socialized medicine by taking a more active role in politics. He reminded his dinner audience that this is an election year.

Mr. Gates pointed out that both doctors and their wives must get into the political action field and join with other conservatives to forestall legislation which would be harmful to the medical profession.

"How many of you know your congressman," he asked, "or your sheriff, county clerk, or county political party chairman?"

Congressmen, Gates said, often "complain that doctors only contact them when they are in trouble." The medical profession can get a valuable ally by making use of the contacts they have.

"We can't work this thing alone," he said, and called on doctors to help elect "good candidates" by talking to their 2,000,000 patients and seeking the alliance of other conservatives in the business and professional community.

CALIFORNIA GOVERNOR PROPOSES ELIMINATION OF BRAND NAME DRUG PAYMENTS

A new state policy to save money spent for brand name drugs has been proposed by California's Governor Pat Brown. The California Chief Executive has suggested that the California State Board of Social Welfare adopt a new policy which would eliminate payment for brand name drugs for public assistance recipients when equally effective non-brand name drugs are less expensive.

He expresses belief that considerable savings could be made in the $10 million to $12 million spent yearly on drugs under various state aid programs. These include aid to the aged, the blind, the disabled and needy children.

The Governor's request was based on a study by the State Public Health Department which revealed prices vary greatly depending on whether a drug is dispensed under a brand or generic name. He said competent medical advice is available to help the Social Welfare Board determine the drugs to which the new policy could apply.

NEW AMA PRESIDENT CITES CHALLENGE

Medicine faces its greatest challenge in the next decade, said Dr. E. Vincent Askey, Los Angeles, who was installed as the 114th President of the American Medical Association. He called the next ten years "the decisive decade."

Threat Cited

Doctor Askey cited the continuing threat of government intervention into medical practice at a time when the nation is enjoying the best health in its history. He pointed out that medicine moved quickly, applying rapidly developing medical tools and techniques in the "fifties" because it was free to move, unhampered by government restrictions.

"It is ironic," said Doctor Askey, "that at the very moment our capacity for individualized treatment is heralding a revolution in medical care, the pressures mount heavier to force us into adoption of assembly line methods."

Several hundred physicians and guests heard Doctor Askey present his inaugural address and John S. Millis, Ph.D., President of Western Reserve University, Cleveland, Ohio, who spoke on "Responsibility in a Changing World."

Medal Given Doctor Orr

The past president's medal was presented to retiring President Louis M. Orr, M.D., Orlando, Florida, by Leonard W. Larson, M.D., Bismarck, North Dakota, Chairman of the AMA Board of Trustees and President-Elect. Doctor Larson hailed Doctor Orr for the "vitality and dedication" with which he led the medical profession in one of its more troubled times.

In accepting the medal, Doctor Orr said the price of progress can only be continuing observance of those standards in medical affairs which lead moral conduct, community activities and political endeavors toward the goal of ever-increasing medical advances.

The 1960 recipient of the American Medical Association's Distinguished Service Award also was honored at the inaugural. Dr. Charles A. Doan, Dean of the Ohio State University College of Medicine and Director of the Health Center in Columbus, was presented the award for his outstanding work in the field of hematology.

MD Cannot Be Cog

Throughout the evening the point repeatedly was made that no doctor can function effectively as a cog in a governmental machine.

"A cog must turn as the wheel turns—must mesh, obedient to the machine of which it is a subordinate part. A cog can exercise no judgment, demonstrate no skill, deviate to no appreciable degree from its prescribed function," the new AMA president concluded. "Good doctors make bad cogs; good cogs become bad doctors."

To meet the challenge of government intervention, Doctor Askey said, the medical profession must be more active in community affairs. In addition to his continued postgraduate educational efforts and dedicated service to his patients, each doctor must make his viewpoint known. He must speak out in behalf of his profession in health matters.

JOBS FOR AGED, DEFEAT OF GOVERNMENT MEDICINE URGED BY RETIRING AMA PRESIDENT

In his farewell address, Dr. Louis M. Orr, retiring President of the American Medical Association, urged physicians to remain vigilant in efforts to defeat old or new Forand-type legislation embodying features of compulsion in providing for the health needs of the aged or other selected segments of the population.

Pointing out that medicine favors "the best kind of medical care for the aged" achieved through voluntary, competitive methods, Doctor Orr recommended that the House go on record favoring:

** More jobs for the aged.

** Voluntary retirement.

** A campaign against discrimination because of age, whether it be forty or sixty-five.

Lauds Aged Bill

Doctor Orr also said the AMA believes the House Ways and Means Committee acted wisely in approving a new Title XVI to the Social Security Act initiating a federal-state, grant-in-aid program to help states assist the near-needy aged who cannot meet their medical expenses.

AMA has committed itself to leadership in studying and answering questions related to the cost of medical care, Doctor Orr also said, by establishing a Commission on Medical Care Costs.

Doctor Orr, who serves as chairman of the Commission, said medicine long ago pledged itself to "provide the best possible care at the least possible cost" to all people. He said it is imperative that physicians adhere to the principle of charging reasonable fees for professional services rendered. Otherwise, doctors pave the way for outside intervention and control of medicine.

SURVEY SHOWS WHY PATIENTS DISREGARD PRESCRIPTIONS

Patients disregard at least 14 per cent of all prescriptions, according to a survey by Lakeside Laboratory.

Results of the survey showed that of every 100 prescriptions written, sixty-nine were filled, seventeen were not filled because the product was unavailable at the drug store and fourteen were not filled because the patients totally disregarded them.

Reasons given by the 14 per cent of the patients who failed to have the prescriptions filled were as follows:

The patients "felt better the very next morning." "Couldn't get the prescription filled, the drug store was closed." The patient "recognized the name of the drug, it wasn't helpful to me before."

JUDGE CRITICIZES ATTORNEYS WHO FILE MALPRACTICE CASES WITHOUT SUBSTANTIAL GROUNDS

On March 17, 1960, Judge Felix Forte, of the Superior Civil Court, Lawrence, Massachusetts, severely criticized attorneys who present malpractice cases without having substantial grounds for such action, as he directed verdicts in three malpractice actions for the defendant physicians.

In commenting to the jury, Judge Forte said, "If every time an operation goes wrong a doctor is going to be sued and goes through the trouble and expense these doctors have gone through, how many doctors are going to be willing to take those chances?"

Public Health

METROPOLITAN AND SUBURBAN WATER PROBLEMS

Studies during the past year have disclosed that much of the ground water supplying individual wells in built-up areas, where septic tanks and soil absorption systems have been used for disposal of sewage, shows the effect of the sewage through the presence of chemicals and bacteria of sewage origin. In the metropolitan area, where some 375,000 persons are dependent on such facilities. surveys have been made of thirty-three communities with some 55,000 wells. Results have ranged from no evidence of sewage in the wells of one small community to 100 per cent of the wells affected in a half-dozen others. The overall results in the communities surveyed show that 50 per cent of the wells tested were contaminated by sewage as evidenced by the presence of detergents or elevated nitrates.

The likelihood and extent of this condition are dependent upon several factors, such as, population density, well depth, and type of soil. Deeper wells have been less affected than shallow ones and wells in areas of dense clay are less likely to be contaminated than those in sand, gravel or broken rock.

Although there have been no cases of illness reported as being caused by this situation, the presence of sewage in drinking water must be regarded as a hazard. The greatest need, of course, is provision of water from a safe source, usually on a community or area basis since it is more economical to build one safe water supply to serve a large number of users than for each to provide his own. In addition it is necessary to plan for proper sewage collection and treatment of sewage to avoid the ultimate contamination of the deeper water sources.

Surveys made in a half dozen out-state communities have shown that the contamination of ground water by septic tank effluents is not limited to the metropolitan suburbs. The results of all of the studies confirm the contention of health officials that while individual wells and septic tanks can give satisfactory service in isolated situations they are not suitable for use in densely populated areas.

The Federal Housing Administration has set limits on the amount of sewage chemicals that it will accept in the water for properties for which it will insure mortgages. This and the general concern over water quality has stimulated several of the metropolitan suburbs to plan for public water systems. Some of them propose to contract for water from one of the major cities, while others prefer to construct their own wells. With a limit to the amount of water that can be drawn from the ground, it appears that in time it will be necessary for more and more water to be taken from the Mississippi River. Here again there is a limit to the amount of water that is available during periods of low flow.

In 1961 legislative session, bills will be introduced on several subjects relating to this situation. Among these will be bills for:

1. Providing an expanded sewage disposal authority for the Twin City metropolitan area.
2. Authorizing the creation of sanitary districts to solve sewage disposal problems not limited to a single community.
3. Simplifying the procedure for a municipality to provide a public water supply.
4. Providing for augmentation of low flows in the Mississippi River by regulating the storage and use of water in the headwater reservoirs.

A bill is also likely to be introduced to authorize creation of a single water authority for the Twin City area, probably as a part of a multi-purpose authority to deal with water supply, sewage disposal and other problems common to the metropolitan area. While a central water authority is undoubtedly desirable for the future, in view of the need for regulating withdrawal of water from the various limited sources, it is not essential for the solution of present water problems of the suburbs, each of which can provide its own supply. Inclusion of this item could make difficult the enactment of the vitally needed legislation for creation of an enlarged sewage disposal authority.

Civil Defense News

CARL WALDRON, M.D., D.D.S., *Chairman, Civil Defense and Disaster Committee, Minnesota State Medical Association*

M. D. TYSON, *Civil Defense Co-ordinator, Minnesota State Department of Health*

COUNCIL CONFERENCE

The Ninth U. S. Civil Defense Council Conference, Medical-Health Section, will be held September 21-22, 1960, at the Leamington Hotel in Minneapolis, Minnesota.

The program for the two-day event is as follows:

Wednesday—September 21, 1960

A.M.

8:00 Registration
9:00 Call to Order—CARROLL HUNGATE, M.D.
9:10 The Chemical Warfare Threat—DR. CARL R. BREWER
9:50 The Biological Warfare Threat—LEROY FOTHERGILL, M.D.
10:30 Coffee Break
10:45 Civilian Medical Problems—COL. DAN CROZIER
11:25 What to remember—What has been done and what is still to be done about Chemical and Biological Warfare—CHARLES STEELE, M.D.
12:00 Combined Lunch—The Hall of States
Address: The HON. WALTER H. JUDD, U. S. Congressman from Minn.
Emergency Health Services

P.M.

2:00 Introduction—CARROLL P. HUNGATE, M.D.
2:15 Emergency Health Service Concept—C. J. WAGNER, M.D.
2:35 Community Emergency Health Program—GEORGE MOORE, M.D.
2:55 Health Manpower Management—ROBERT L. SMITH, M.D.
3:15 Health Mobilization Training—MR. JERROLD M. MICHAEL
3:35 Health Resources Management—MR. ARNOLD H. DODGE
3:55 Chemical, Biological & Radiological Defense (Non-military) MR. CHARLES H. HARP
4:15 Emergency Engineering and Sanitation—MR. CHARLES V. WRIGHT
4:35 St. Paul Day—Trip to St. Paul—Buffet Dinner —Ice Capades Show

Thursday—September 22, 1960

A.M.

9:00 Call to Order—EDWARD G. SHARP, M.D.
9:10 Chemical Warfare Defense Workshop—COL. GEORGE D. RICH
10:10 Biological Warfare Defense Workshop—DR. CHAS. PHILLIPS
11:10 Radiological Warfare Defense Workshop—MR. BENJAMIN KILLIAN
12:10 Medical-Health Luncheon—The Hall of States (Speaker to be announced)

P.M.

2:00 Call to Order—CARL WALDRON, M.D.
2:10 Civil Defense Emergency Hospital Workshop—MR. JERROLD M. MICHAEL
6:00 Social Hour—The Hall of States
7:00 Citation Banquet—The Hall of States

Outstanding personalities in the field of Civil Defense and Disaster preparedness will be honored.

Participants in the Conference are:

Carl R. Brewer, Ph.D., Chief, Research Division, U. S. Army Chemical Corps Research and Development Command, Washington, D. C.

Col. Dan Crozier, Office of the Surgeon General, U. S. Army, Washington, D. C.

Arnold H. Dodge, Chief Health Resources Branch, Division of Health Mobilization, P.H.S., Washington D. C.

Leroy D. Fothergill, M.D., Scientific Advisor, U. S. Army Biological Warfare Laboratories, Ft. Detrick, Maryland

Charles H. Harp, Chief, C.B.R. Defense Branch, Division of Health Mobilization, P.H.S., Washington, D. C.

Carroll P. Hungate, M.D., Chairman, Committee on Disaster Medical Care, American Medical Association, Member, Council on National Security A.M.A., Kansas City, Missouri

The Honorable Walter H. Judd, U. S. Congressman from Minnesota

Benjamin C. Killian, Physical Sciences Administrator, P.H.S., Region III, Charlottesville, Virginia

Mr. Jerrold M. Michael, Chief, Training Branch, Division of Health Mobilization, P.H.S., Washington, D. C.

George Moore, M.D., Program Director for Health Mobilization, P.H.S., Region III, Charlottesville, Virginia

Charles R. Phillips, Ph.D., Chief, Physical Defense Division, U. S. Army Biological Warfare Laboratories, Ft. Detrick, Maryland

Col. George D. Rich, Deputy Assistant Director for C.B.R. Defense, O.C.D.M., Battle Creek, Michigan

Edward G. Sharp, M.D., Medical-Health Liaison Representative, U. S. Civil Defense Council, Philadelphia, Pennsylvania

Robert L. Smith, M.D., Deputy Chief, Division of Health Mobilization, P.H.S., Washington, D. C.

Charles W. Steele, M.D., Member, Committee on Disaster Medical Care, A.M.A., and Liaison representative on Civil Defense, American Chemical Society, Chairman Committee on Disaster Medical Care, Maine Medical Association, Lewiston, Maine

Carruth J. Wagner, M.D., Chief, Division of Health Mobilization, P.H.S., Washington, D. C.

Carl Waldron, M.D., Co-Chairman, Medical-Health Committee, U. S. Civil Defense Council

Charles V. Wright, Assistant Chief, Division of Health Mobilization, P.H.S., Washington, D. C.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

EXPOSE FOOD FADS THROUGH EDUCATION

One of the most disturbing problems in the field of nutrition and health is the speed with which food fads and food misinformation is spreading. Distorting facts into fads is a thriving business today and the twentieth century seems to have its own diversified brands of "cure-alls."

A vast amount of misinformation about diet is reaching the public by many channels. Through the media of mass communication—magazines, newspapers, radio, television—person-to-person, and even through libraries, the American people are being propagandized into trying this or that "quick cure." Never have so many false claims been made and never has so much false information been accepted by so many people.

There are several types of food fads. These include extravagant assertions for particular foods, emphasis on the use of "natural" rather than processed foods, self-prescribing of vitamin pills, the indiscriminate use of food supplements, the certainty of being poisoned from cooking in aluminum utensils, eating of "brain foods," and fads involving special reducing diets.

Age of "Modern Medicine Man"

An article in a recent issue of a well-known magazine reminds us that we are not as far away from the old-time medicine man of the last century as we would like to believe. According to the magazine story, "Adult feeding formulas" are conversation pieces at every gathering of informed persons.

The article suggests that it is possible to diet surely and painlessly through formula feeding and refers its readers to the labels on the products to find instructions for proper use.

Whatever the claim for these fabulous formulas, it is important to distrust any suggestion for self-medication and to remember that self-prescribing can be dangerous. Equally important is to have the advice and recommendation of a physician before going on any special diet. The "do-it-yourself" method may be a good way to install tile on the basement floor, but it is not the solution to weight reduction. Any person trying to reduce weight is taking a risk without guidance from a physician.

Food Quacks Lead Field

Speaking at the 1959 annual meeting of the American Dietetic Association, Wallace F. Janssen, Director, Division of Public Information, Food and Drug Administration, pointed out that more "quackery" is being practiced in regard to food and nutrition than in any other field. He suggests "the only effective means of combating this type of misinformation is education of the public." Education, continuing education, is the weapon which eventually will prove most effective in checking activities of the food faddist.

The American Medical Association is currently carrying out a campaign against food faddism and has produced an educational film on the subject entitled "The Medicine Man." The American Dietetic Association, the Nutrition Foundation, and the Food and Drug Administration, also, are presently active in the field of combating food misinformation.

United Education Program Announced

Three Minnesota organizations—The Minnesota State Medical Association with the assistance of the Woman's Auxiliary, the Minnesota Dietectic Association and the Minnesota Department of Health—have joined forces to set up an educational program of combating false and misleading propaganda about food. To present up-to-date fundamental facts and improve the scientific accuracy of information about

diet and nutrition, these organizations plan to hold a series of community meetings throughout the state beginning in September.

"For every food fallacy there is a food fact; for every 'rage,' 'vogue' or 'fad' diet there is a basic eating pattern built around the protective foods to provide adequate nutrition." To get this message from the American Dietetic Association, to the public and to provide accurate scientific information which everyone can understand is the challenge which Minnesotans have accepted.

All-out Effort Needed

To do the job—to acquaint and educate the public with sane and sound food and nutrition information—required the interest and co-operation of everyone. It requires the help of leaders and representatives of civic, business and industry, church, labor, educational and professional groups including the Parent-Teacher Associations, the Chamber of Commerce, the Better Business Bureau, the YWCA, Rotary, Kiwanis and other organizations in the community.

In the words of Philip L. White, M.D., Secretary of the Council on Foods and Nutrition, American Medical Association, "We consider this a vital education campaign, and we invite your support in exposing the food faddists and the promoters of eccentric diets whose fraudulent claims are luring a large segment of the American people away from sound nutritional habits and competent medical care."

Your Help Also Needed

Because the nutrition quack can endanger the entire community, undermine its confidence in common, everyday foods, and scoff at the necessity of competent medical care, various organizations and industries have a place in this program.

The medical profession of your community should be prepared to assist you in disseminating health education information to the general public through meetings, club programs, schools, fairs, church groups, unions, newspapers, magazines, television and radio.

Can We Help You?

The Minnesota State Medical Association is interested in the progress and success of this program, and we want to be of the greatest possible assistance to you. Please let us know when we can help, and we would appreciate hearing of your plans.

The following are available from the State Office.

** "The Merchants of Menace"—Eight-page two-color pamphlet, outlining the dangers of food faddism. Available in quantity without charge.

** "Let 'Em Eat Hay"—Reprint of an article in the September, 1958, issue of *Today's Health,* presenting a comprehensive review of food quackery and nutrition nonsense. Available in quantity without charge.

** "The Medicine Man"—Twenty-seven minute, black and white motion picture, produced in Hollywood especially for this campaign. Available for both television and community groups. No charge.

** "Nutrition Nonsense and False Claims"—A major, ten-foot exhibit for use at fairs and large meetings. No charge; pay only round-trip transportation costs. Please request well in advance of expected showing.

Mrs. Gaynold Jensen, *Chairman*
Community Nutrition Section
Minnesota Dietetic Association

PHYSICIANS URGED TO USE "MD"

Doctors of Medicine are urged to use "MD" after their names to distinguish them from all other kinds of doctors in the world today.

The American Medical Association will encourage such use of "MD", following the recommendation of the House of Delegates. "The term 'Dr.' is commonly used today to preface the names of doctors of chemistry, laws, divinity, and others, including those in the practice of cultism and quackery, as well as those in the practice of medicine," said a resolution adopted by the House.

The American Medical Association and your State Association will seek "to inform the public of the meaning of 'Doctor of Medicine' as contrasted with other 'doctor' designations."

WHY *ALDACTONE*®

IN EDEMA

Because it acts by regulating a basic physiologic imbalance, Aldactone possesses multiple therapeutic advantages in treating edema.

Aldactone inactivates a crucial mechanism producing and maintaining edema — the effect of excessive activity of the potent salt-retaining hormone, aldosterone. This corrective action produces a satisfactory relief of edema even in conditions wholly or partially refractory to other drugs.

Also, Aldactone acts in a different manner and at a different site in the renal tubules than other drugs. This difference in action permits a true synergism with mercurial and thiazide diuretics, supplementing and potentiating their beneficial effects.

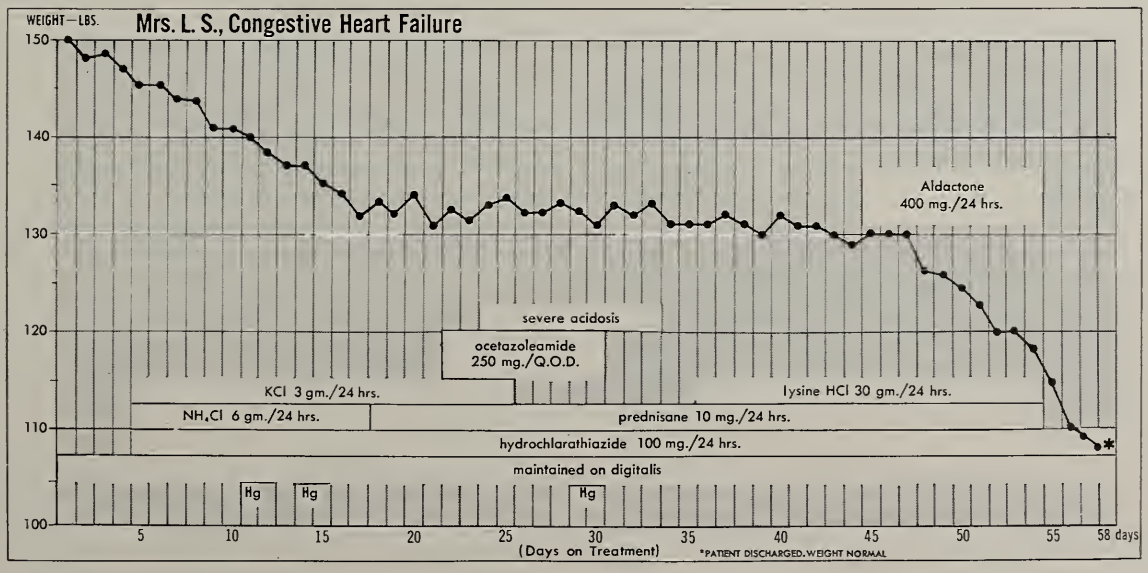
Further, Aldactone minimizes the electrolyte upheaval often caused by mercurial and thiazide compounds.

The accompanying graph shows a dramatic but by no means unusual instance of the effect of Aldactone in refractory edema.

The usual adult dosage of Aldactone, brand of spironolactone, is 400 mg. daily. Complete dosage information is contained in Searle New Product Brochure No. 52.

SUPPLIED: Aldactone is supplied as compression-coated yellow tablets of 100 mg.

G. D. SEARLE & CO., Chicago 80, Illinois.
Research in the Service of Medicine.



Minnesota Blue Shield

New Headquarters

Minnesota Blue Shield, on July 15, moved to its new headquarters at 2218 University Avenue, St. Paul, seven blocks from the Blue Cross building, where it had previously maintained offices.

The new location is a three-story building, with basement, totaling 24,000 square feet, which Blue Shield purchased earlier this year. Since then, extensive remodeling and alterations have been made in preparation for the move.

Administrative offices and the Division of Enrollment and Service occupy the first floor. The second floor houses IBM high-speed data-processing equipment for handling accounting and record-keeping functions. The IBM units had been in operation for some time at the new headquarters, in advance of the move. The claims department is located on the third floor. Also included in the new building is an employe's cafeteria.

The move, which began after business hours on Friday, was made without any interruption of service, with Blue Shield personnel resuming work in their new offices the following Monday morning.

Commenting on the move, Dr. Richard R. Cranmer, Executive Director of Minnesota Medical Service, Inc., said:

"Our new headquarters will give Blue Shield a more economical yet completely adequate home, with more than double the amount of square footage available than formerly. Our new home will also make possible the more efficient location of all our departments to provide prompt service for the more than 800,000 Minnesota Blue Shield subscribers."

Blue Shield subscribers, Doctor Cranmer added, represent about one-quarter of the total population of Minnesota.

Vice President Layton Urges Professional Cooperation

Dr. Ira C. Layton, Vice President of the Blue Shield Plan in Kansas City, in a recent address before the Kentucky State Medical Association's annual County Society Officers' Conference, analyzed the pressures being brought for government intervention in the medical care field and urged stronger co-operation of the medical profession with Blue Shield as the best answer to these pressures.

Doctor Layton said. "Certainly the requests of the public for increased scope of benefits, more adequate fee schedules whether on a service or indemnity basis, will be met and must be met by the doctor's plan if the practice of medicine is to survive in its present form."

He added that Blue Shield and the medical profession in this country are mutually dependent, for Blue Shield would not survive long in the area it serves without the medical profession's support, nor would the independent practice of medicine last long in the absence of Blue Shield.

New Challenges Lie Ahead

Also, while Blue Shield has thus far met the challenge and effectively answered critics of voluntary prepayment plans, new challenges continually lie ahead.

In our effort to save the free and voluntary system of health care, we must remind our critics—and ourselves—that Blue Shield has made a most significant contribution to the nation's public health. By pioneering in community-wide prepayment programs, it has assumed risks that commercial companies had previously declined to undertake. Yet, by setting the pace for health-care programs, Blue Shield eventually led these same commercial companies to devise health care programs of their own. As a result, more than 127 million Americans, or 72 per cent of the civilian population. were covered by some type of health insurance by the end of 1959.

Benefit payments by all forms of health care plans in 1959 totaled $4.3 billion.

Although these payments represent a tremendous impact on our economy, the real value of such widespread voluntary coverage—which Blue Shield pioneered—is beyond measuring, for the nation's public health is far sounder as a result. Prepayment coverage has encouraged our citizens to seek timely medical care and they and the nation have reaped immense benefits because of this.

Meanwhile, Minnesota Blue Shield has taken further pioneering steps, by adding such innovations as coverage for diagnostic, x-ray, and laboratory service benefits within standard contracts. This cannot but encourage still earlier diagnosis of what might have proven major disorders were not such diagnostic coverage available.

Blue Shield can, indeed, be proud of its past record and its promise for the future, and participating physicians can likewise be proud of their association with such an organization. When the public more fully understands these significant contributions by Blue Shield, pressures for governmental involuntary methods should abate, in favor of confidence in a program that has stood well the test of time and helped maintain the high standards of medical practice in this country.



6-10 HOURS
SUSTAINED THERAPY

ONE *and only* ONE
Timed AMO*dex* CAPSULE
PER DAY *will economically*

control appetite in weight reduction or relieve the nervous symptoms of anxiety and the underlying depression.

Timed AMO*dex CAPSULES* (Testagar) furnish a controlled uniform action. The medications provide prolonged, continuous therapeutic effect from active ingredients over a period of 6 to 10 hours.

Following ingestion of one *Timed* AMO*dex CAPSULE,* small amounts of the medication are released immediately.

Each *Timed* AMO*dex CAPSULE* contains a daily therapeutic dose of:

Dextro-amphetamine hydrochloride	15 mg.,
Amobarbital	60 mg.

PROTRACTED THERAPEUTIC EFFECT

Before the development of *Timed* AMO*dex* (Testagar) the usual dose of Dextro-amphetamine hydrochloride, for the control of appetite, was one 5 mg. tablet two or three times a day. The usual dose of Amobarbital ranged from 20 to 40 mg., two or three times a day. On such a dosage regimen the absorption of the drugs, after ingestion, takes place quite rapidly. The therapeutic activity occurs within one-half to one hour. When the therapeutic peak is reached, a gradual decline takes place. At this point, the patient should receive another dose of medication . . . the cycle is then repeated.

Patients frequently fail to follow the physician's instructions. They take medication at irregular intervals. When this occurs with drugs such as dextro-amphetamine sulfate, phosphate or hydrochloride, excitation may result. A balanced combination of Dextro-amphetamine hydrochloride, **the preferred salt,** plus a balanced daily dose of Amobarbital will give the expected therapeutic results *without* excitation.

Timed AMO*dex,* after ingestion, releases Dextro-amphetamine Hydrochloride and Amobarbital steadily and uniformly over a period of 6 to 10 hours. Therefore, the physician may dispense with the usual dosage schedule thereby *attaining better control of therapy.* The patient will receive the benefits of even and sustained therapeutic effects. Side reactions such as anxiety and excitation are greatly minimized.

AMO*dex* ADVANTAGES

- HIGH-LEVEL ANOREXIGENIC ACTIVITY WITHOUT NERVOUS EXCITATION
- SMOOTH, UNIFORM ACTION
- THERAPEUTIC EFFECT LASTING 6 TO 10 HOURS
- ONLY ONE DOSE DAILY
- CLINICALLY ECONOMICAL TO THE PATIENT

ACTION AND USES

Timed AMO*dex CAPSULES* (Testagar) supply the antidepressant and mood-elevating effects of Dextro-amphetamine hydrochloride and the calming action of Amobarbital. *Timed* AMO*dex* elevates the mood, relieves nervous tension, restores emotional stability and the capacity for mental and physical effort.

INDICATIONS

Timed AMO*dex* is the preferred treatment in anxiety states and in the management of obesity. *Timed* AMO*dex* may also be used in the treatment of Depressive states, Alcoholism, Nausea and Vomiting of Pregnancy.

DOSAGE The Daily Dose of *Timed* AMO*dex* (Testagar) IS ONE CAPSULE ON ARISING OR AT BREAKFAST.

SUPPLIED Bottles of 100 and 1000 capsules, available at all pharmacies. Also supplied in half strength as *Timed* AMO*dex,* Jr.

Timed AMO*dex CAPSULES* are manufactured under these patent numbers:
2,736,682 — 2,809,916
2,809,917 — 2,809,918
Which provide prolonged, continuous therapeutic effect over a period of 6-10 hours

SAMPLES AND LITERATURE UPON REQUEST

Testagar & co., inc. 1354 W. Lafayette Blvd. Detroit 26, Michigan

Communications

DETECTION OF GASTRIC CANCER BY RADIOAUTOGRAPHY

My Dear Colleagues:

Radioactive phosphorus has been found to be extremely useful in the detection of gastric cancer in man. Greater experience is needed in the appraisal of the value of the method in difficult diagnostic gastric problems, in which roentgen or clinical techniques fail to clarify the exact nature of the lesion. Through the generosity of the American Cancer Society, monies have been obtained to support such a pilot study without cost to the patient.

Gastric cancer appears to be a diminishing disease. The free flow of patients with gastric cancer that came at an earlier date is not so much in evidence now. We would welcome the opportunity therefore of evaluating any available difficult diagnostic problems by this technique. If any cases are sent to the University Out-Patient Clinic, for the purpose, we would welcome receiving from the referring physician a brief statement together with recent, as well as earlier, x-ray films.

The patient under conventional circumstances would be managed as an out-patient with a half-a-day's hospitalization, following which he would be returned to his physician with a statement concerning our findings.

Our experience to date, though limited, would suggest that mucosal gastric cancer can be detected by this method. The patient ingests 500 microcuries of radioactive P32 twenty-four hours before the beginning of the test. A small deflated balloon coated with a photosensitized emulsion is swallowed, by the patient in a dark room, following which he returns to his bed for four hours. Extubation is performed in the darkroom and a cancer, if present, becomes apparent at once as a dark spot on the balloon, owing to the greater affinity of malignant tissue for P32, contrasted with the contiguous normal gastric mucosa.

It is the time factor of prolonged exposure which makes it possible to detect gastric cancer by this means. In all patients examined to date, when gastric cancer has been present, it has been correctly identified. The method also has important confirmatory value in the presence of positive x-rays. In mucosal gastric cancers in which all known available techniques of cancer detection are notably inefficient, it is believed that the technique described herein will prove useful, even in early gastric malignancies with poorly defined symptoms.

Any physician desiring to avail himself of this service for his patient, and without cost, may do so, by communicating with this Office. You may find we may be of some help to you and you can be of great help to us.

Owen H. Wangensteen, M.D.
Chairman, Department of Surgery
University Hospitals

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

FORMATION OF ADVISORY COUNCIL FOR NBC-RCA MEDICAL RADIO SYSTEM

The formation of an Advisory Council for the NBC-RCA Medical Radio System was announced May 18 at the fourth meeting of the System's Editorial Board in New York. The Council will be composed of fifty-five panels representing all leading specialties in the field of medicine. It was announced that ninety physicians had accepted positions on the Council. Additional panel members will be appointed with the Council roster expected to total 150.

Each of the fifty-five panels will be made up of from three to five or more outstanding doctors in each specialty. Physicians accepting the nominations will advise the Editorial Board on developments in their particular specialty. In addition to this, they will act as consultants, participate in programs of the Medical Radio System, and write papers on their specialty. The panel members, together with the Editorial Board, and the System's Medical Editor, Dr. Cornelius H. Traeger, represent an assemblage of outstanding leaders in the field of medicine.

Dr. Chester Scott Keefer, Editorial Board Chairman and President of the American College of Physicians, presided at the meeting.

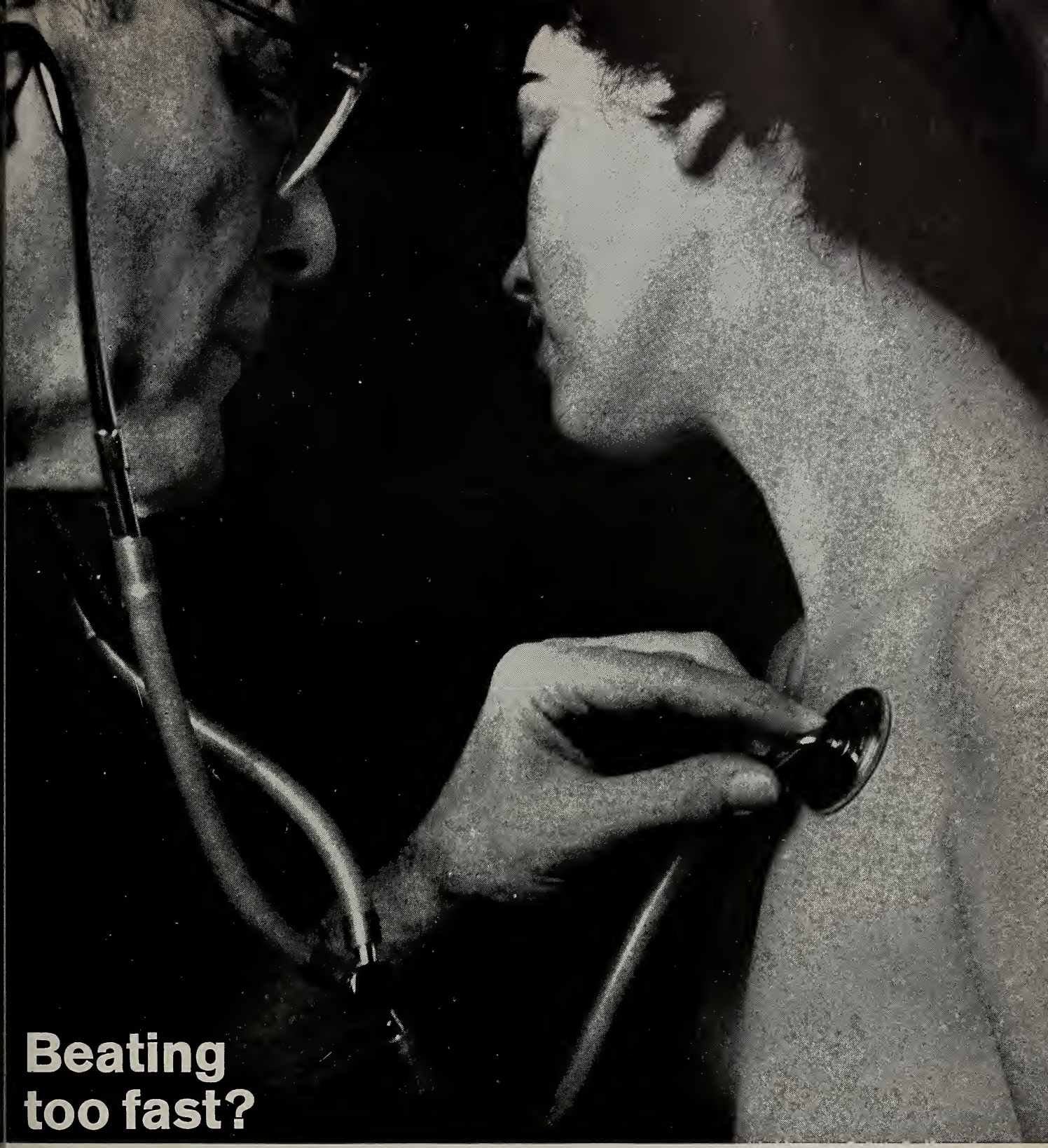
Sale offices for doctors' subscriptions have been established in New York, Chicago, Los Angeles, San Francisco, Boston, Baltimore, Washington, Philadelphia, Pittsburgh, Atlanta, Minneapolis-St. Paul, and Dallas-Fort Worth.

Field testing of the especially designed FM Multiplex equipment has been completed and an announcement of the on-the-air date will be forthcoming shortly.

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It is our objective to produce the finest reagents obtainable for clinical laboratory use. Their consistent accuracy saves hours of the technician's time.

Our scientific laboratory control is your assurance that Ulmer reagents are always fresh and meet the most exacting standards for each procedure. Every step of the manufacturing process is checked from the raw materials to the finished product. Moreover, our chemists are available to assist with any procedures with which you may be experiencing difficulties. Do not hesitate to call on them for assistance or advice.

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In Memoriam

JACOB S. BLUMENTHAL

Dr. Jacob S. Blumenthal, Minneapolis physician, died July 3, 1960, at the age of sixty.

Doctor Blumenthal had been a member of the School of Medicine faculty at the University of Minnesota for thirty years. He was a staff member of Mt. Sinai, St. Andrews, St. Barnabas, Minneapolis General and the University Hospitals.

Doctor Blumenthal was born in Roumania and received his preliminary education from North High School and the University of Minnesota in Minneapolis. His medical education was obtained at the University of Minnesota Medical School from which he graduated in 1923.

Doctor Blumenthal was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association. In addition, he belonged to the Minneapolis Pathology Society, the Minneapolis Society of Internal Medicine, the Minneapolis College of Chest Physicians, and other professional groups. He was a veteran of World War I and was a member of the American Legion.

Survivors include his wife, Hannah; one son, Dr. Malcolm N. Blumenthal, Minneapolis; a daughter, Mrs. Myra Lou Shapiro, Lansing, Michigan; a brother, Carl, Minneapolis, and three grandchildren.

CLAUDE L. HANEY

Dr. Claude L. Haney, one of Duluth's oldest practicing physicians, died June 15, 1960. He was eighty years of age at the time of his death.

He was born in 1880 in Austin, Minnesota, and received his preliminary education at Austin High School, and the University of Minnesota. His medical education was obtained at the University of Minnesota Medical School from which he graduated in 1906. His internship was served at St. Mary's Hospital in Duluth and he practiced medicine there since.

Doctor Haney was active in civic affairs, serving twelve years on the Board of Education and in Masonic circles. During World War I, Doctor Haney was a captain in the army medical corps. He was also a member of the Duluth Selective Service Board during World War I.

In 1937, Doctor Haney terminated his service on the School Board. He was treasurer in 1935-36.

Doctor Haney was a member of the West End American Legion Post, a life member of the St. Louis County Medical Society and the American Medical Association. He received his life membership in the Minnesota State Medical Association in 1950 and his fifty-year club membership in 1957.

He was a past potentate of Aad Temple, Shrine, member of Trinity Lodge, AF & AM, Duluth Scottish Rite bodies and Knights Templar.

Surviving are his wife, Elsie F.; a daughter, Mrs. Ancel Keys, St. Paul, and three grandchildren.

KANO IKEDA

Dr. Kano Ikeda, well-known pathologist at a number of hospitals in St. Paul for many years, died June 26, 1960. Doctor Ikeda was seventy-three years of age at the time of his death.

Doctor Ikeda was born in Tokyo, Japan, in 1886 and received his preliminary education at Tokyo, Japan, and Fusan, Chosen, Korea. He attended the Battle Creek College in Battle Creek, Michigan, after coming to the United States in 1904. He graduated from the College of Medicine, University of Illinois, in 1911, and served his internship at Asbury Hospital in Minneapolis. He was at the University of Minnesota on a teaching fellowship in bacteriology and pathology from 1916 to 1918.

Doctor Ikeda was Director of Laboratory and Pathology in Miller Hospital from 1929 until his retirement last December, 1959. During those years, he served in the same capacity at Children's Hospital, Gillette Hospital for Crippled Children and Riverview Memorial Hospital. He was also consulting pathologist in Midway and Mounds Hospitals and served as associate professor of pathology in the medical and graduate schools at the University of Minnesota and was professor of medical technology at Macalester College.

Doctor Ikeda was a member of the American Association for Cancer Research, the American Association of Pathologists and Bacteriologists and the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association. He belonged to the American Society of Clinical Pathologists, having served on the Executive Committee from 1934 to 1937 and as Secretary of the Board of Registry from 1929 to 1942.

He was associated with the International Association of Medical Museums, Radiological Society of North America, a fellow in the College of American Pathologists, a fellow in the American College of Physicians and the Minnesota Pathological Society, in which he had been president. He was also a member of the Minnesota Society of Clinical Pathologists, in which he served twice as president and several terms as secretary.

Survivors are his wife, Mae; a daughter, Ethel M. of West St. Paul; a son, Alden T. Ikeda, St. Paul; three grandchildren, and a brother in Japan.

HENRY P. LINNER

Dr. Henry P. Linner, Minneapolis, died June 25, 1960, at his summer home at Lake Minnewashta. Doctor Linner was eighty-one years old.

Born at Chisago City, Minnesota, in 1879, he received his preliminary education at Gustavus Adolphus College, in St. Peter, Minnesota. He attended the University of Minnesota Medical School and graduated from there in 1909. He served his internship at Swedish Hospital in Minneapolis.

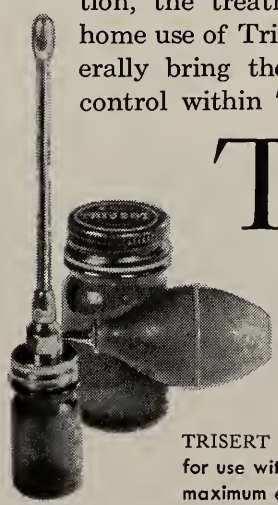
King Gustav of Sweden made him a Knight in the Order of North Star in recognition of his contributions to Swedish-American relations. He also received the royal order of Vasa award.

Doctor Linner was a member of the Board of Gustavus



For fast, complete treatment of vaginal infections

Problem is: she'll wait until discomfort is acute and then expect immediate relief. The answer is Trisert. Trisert preparations contain ALLANTOIN, an effective debriding agent which quickly dissolves heavy mucus often accompanying vaginal infections . . . METHYLBENZETHONIUM CHLORIDE, a quaternary germicide which removes unpleasant odors . . . SUCCINIC ACID, an aid in maintaining optimal vaginal pH . . . 9-AMINOACRIDINE HYDROCHLORIDE which has been included to supplement the bactericidal and trichomonacidal activity of other constituents. Treatment with Trisert Powder will control symptoms fast . . . usually within an hour . . . and provide effective initial treatment for 48 hours. After a second insufflation, the treatment is completed with at home use of Trisert Tablets which will generally bring the infection under complete control within 7 days.



Trisert

TRISERT TABLETS—Patient set, contains bottle of 30 tablets and special inserter. Bulk bottle of 100 tablets.

TRISERT POWDER—Available in 4 gr. individual treatment bottles. 12 to carton.

TRISERT POWDER INSUFFLATOR—Designed for use with Trisert Powder. Its use is urged for maximum efficiency.

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Adolphus College in St. Peter and the First Federal Savings and Loan Association in Minneapolis. He was a member of the Hennepin County Medical Society, a life member in the Minnesota State Medical Association and a member of the American Medical Association. In 1959, Doctor Linner was granted membership in the Fifty Club of the Minnesota State Medical Association. He was a former Chief of Staff at Swedish Hospital and a member of the Hospital's Board for twenty-nine years.

Surviving are his wife, Amanda; two sons, Dr. John H., Edina, and Dr. Paul W. Linner, Minneapolis; two daughters, Mrs. Morley (Carol) Seagren, St. Louis Park, and Mrs. Lewellyn (Melba) Kolstad, Hopkins; and two brothers, Edward Peterson, Chisago City, and Carl Peterson, Minneapolis.

FRANK M. MANSON

Dr. Frank M. Manson, last of Worthington's early-day physicians, died June 10, 1960, at the age of eighty-nine years.

Doctor Manson was born in 1871 at Pine Bend, Minnesota. He grew up at Shakopee where he received his preliminary education. He attended the University of Minnesota Medical School, receiving his Doctor of Medicine degree in 1899. He set up a permanent practice in Worthington, establishing the Worthington Hospital in 1906.

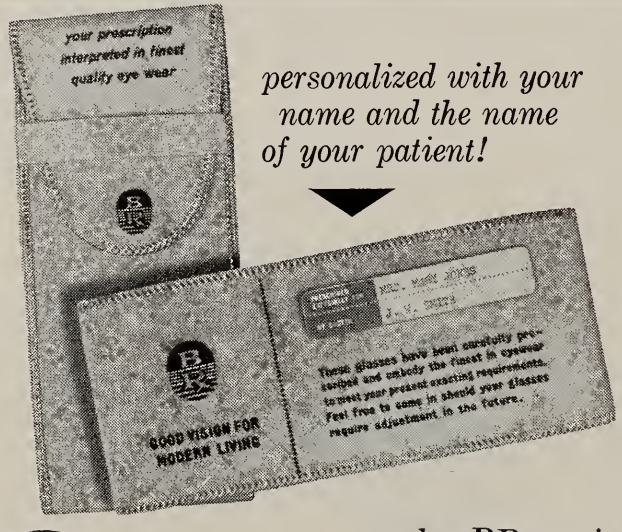
During World War I, he served as Chief of the Surgical Service at Camp Dodge, Iowa, and received special recognition for his work during the influenza epidemic.

Doctor Manson was a fellow of the American College of Surgeons, a member and President of the Kiwanis Club and of the Civic and Commerce Association. He was an associate member of the Minnesota State Medical Association, the Southwestern Minnesota County Medical Society and the American Medical Association.

Doctor Manson is survived by two sons, Dr. Melville Manson, Isles of Pines, Cuba, and Dr. Emmett Manson in Rhode Island, also two grandsons.



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The Physician's Diary

University of Minnesota Professor of Medicine, **Dr. Wesley Spink,** has been appointed to a Board of Physicians to review decisions of Doctor Henry Welch, ousted head of the Food and Drug Administration's Antibiotics Division. Arthur S. Flemming, Secretary of Health, Education and Welfare, named eight physicians to the Board.

* * *

A St. Paul woman physician, **Dr. Marguerite Schwyzer,** one of the newest to join Dr. Tom Dooley's MEDICO task force, reported for work recently in Haiti. Doctor Schwyzer is the sister of **Dr. Hanns Schwyzer,** St. Paul. She will be part of a team of six specialists fighting special disease problems in Haiti. After graduating from Yale University Medical School, she practiced in Massachusetts, Illinois, New York and California. The last six years she has worked with Wilder Dispensary and the University of Minnesota Student Health Service. Doctor Schwyzer, a specialist in internal medicine, became interested in MEDICO after meeting Doctor Dooley, one of the men who set up the organization, when he lectured in St. Paul. She expects to stay with MEDICO for one year.

* * *

The Upper Mississippi Mental Health Center announces the appointment of **Dr. Howard C. Reid,** Amarillo, Texas, as psychiatrist and administrator. Doctor Reid assumed his duties about May 1. **Dr. D. E. Hoganson,** Bemidji, is a member of the Upper Mississippi Mental Health Board.

* * *

Dr. John Hendrickson is now associated in the practice of medicine with **Dr. Les N. Dale** at the Red Lake Falls Clinic. His association became effective July 1.

* * *

Dr. Edmund B. Flink, Chief of Medical Services at the Minneapolis Veterans Hospital, has been appointed Professor and Chairman of the Department of Medicine at West Virginia University in Morgantown, West Virginia.

* * *

New officers of the Minnesota Academy of Ophthalmology and Otolaryngology for the 1960-1961 term of office are as follows: President, **Paul G. Bunder, M.D.,** Aberdeen, South Dakota; First Vice President, **John A. McNeill, M.D.,** St. Paul; Second Vice President, **Benjamin Bofenkamp, M.D.,** Minneapolis; Secretary-Treasurer, **Richard O. Leavenworth, Jr., M.D.,** St. Louis Park. Council members are: **W. T. Wenner, M.D.,** Chairman, St. Cloud; **Thomas Kirby, M.D.,** Rochester; **Douglas R. Kusske, M.D.,** St. Paul; **Walter Lees Hoffman, M.D.,** Minneapolis; and **W. J. Bushard, M.D.,** Minneapolis.

Dr. Herbert E. Warden, one of the team of four University of Minnesota heart surgeons which pioneered open heart surgery in 1954 is leaving the school. He has been appointed to the surgery staff of the new West Virginia Medical School in Morgantown. Doctor Warden was associated with Drs. **C. Walton Lillehei, Richard L. Varco, Morley Cohen** in the surgery. Doctor Warden is the second of the team to leave the University. Doctor Cohen left to return to his surgery practice in Winnipeg.

* * *

A former fellow at the Mayo Clinic, **Dr. Ralph Bowen, Jr.,** has left for Nairobi, Kenya, Africa, where he will be the second plastic surgeon in an area of six million people. Doctor Bowen is going to Africa for one year's study under a travel research grant sponsored jointly by the African Research Foundation and the Medical International Cooperation Organization. He is the only physician working with a newly created mobile unit that seeks out patients, especially those with skin cancer, which is especially prevalent in the area. After a year's study in Africa, Doctor Bowen plans to return to the United States and begin private practice.

* * *

Babbitt, Minnesota, has a new physician. He is **Dr. G. T. Stewart,** formerly of Mt. Ida, Arkansas. Doctor Stewart owned and operated a clinic in Mt. Ida for thirteen years before coming to Babbitt. He specializes in Obstetrics.

* * *

Newly elected officers of the Minnesota Chapter of the Flying Physicians Association for the 1960-1961 term of office are **Dr. O. M. Wilbur,** Hibbing, Minnesota, State Chairman: **Dr. C. H. Scheifley,** Rochester, state co-chairman, and **Dr. Roger S. Johnson,** Excelsior, safety and research state chairman. The Flying Physicians Association is a national organization with some 2000 member flying doctors whose aim is to promote flying safety, aviation health standards for crew members and passengers, and research into the complex problems of space medicine and aging processes of crew members.

* * *

Dr. Donald J. Erickson, Mayo Clinic, spoke at the meeting of the Downtown Kiwanis Club in Rochester. He also showed a film on paraplegia.

* * *

Six St. Paul physicians, all members of St. Joseph's Hospital staff, participated in ceremonies when the hospital's new operating suite was dedicated to the memory of their fathers. The plaque on the first floor of the new John Gregory Murray unit commemorates six surgeons who earned prominence while associated with the hospital. They are **Drs. William Carroll, John Culligan, David Hilger, Justus Ohage, Harry Ritchie** and **Arnold**

Schwyzer. All but Doctor Carroll were represented by sons who are on the staff. Two of Doctor Hilger's sons, both physicians, were among those attending. The sons are Dr. **John A. Culligan, Jerome** and **Laurence Hilger, Justus Ohage, Wallace Ritchie** and **Hanns Schwyzer.**

* * *

Professor of Anatomy at the University of Minnesota Medical School, **Dr. Arnold Lazarow,** has been honored by the University of Chicago Medical Alumni Association. He received the Association's Distinguished Service Award at the annual reunion banquet of the Association.

* * *

Dr. Roland G. Anderson, formerly of the Falls Clinic in Thief River Falls, has opened a private practice of general surgery. His office is located at 214½ LaBree Avenue North, Thief River Falls.

* * *

Members attending the recent dinner meeting of the Southwestern Minnesota Medical Society heard **Dr. William C. Bernstein,** St. Paul proctologist, speak on "Common Ano-Rectal Disorders." Also on the agenda was a discussion of subjects presented by **Dr. John Lohmann** and **Dr. Vernon Vix.**

* * *

Dr. John A. Sturgis, who practiced medicine in Lamberton for two and one-half years, has left to resume an orthopedic surgical residency at Hamot Hospital in Erie, Pennsylvania. Following the residency, Doctor Sturgis plans to remain in the middle eastern states where he will specialize in orthopedic surgery.

Dr. Donald Holm, formerly of Benson, began his residency for advanced study in radiology July 1. Doctor Holm was in practice with **Dr. Robert Nelson** in the Holm-Nelson Clinic in Benson for approximately seven years. Doctor Nelson is continuing his practice in Benson.

* * *

The physician who founded the St. Paul Children's Hospital was honored at an achievement dinner in the Women's City Club in St. Paul. **Dr. Walter R. Ramsey,** started the hospital in 1924. A wing of the new two-million dollar addition has been named the Ramsey Wing in honor of the doctor. Doctor Ramsey received a citation of achievement and gold disk bearing the hospital insignia. Members of the Board of Trustees, the active medical staff of the hospital, heads of departments of the hospital and others associated with the hospital attended the dinner.

* * *

Dr. Arthur C. Kerkhof, president of the Minnesota Heart Association, has announced that Grants-in-aid totaling $97,165 have been awarded to eleven Minnesota scientists for research on diseases of the heart and blood vessels. Minnesotans receiving the awards are: **Dr. Walter O. Lundberg, Richard A. DeWall, Robert A. Good, Ancel Keys, Victor Lober, Edward Ronwin, Henry L. Taylor, Louis Tobian** and **Cecil J. Watson,** all of the University of Minnesota; **Dr. Richard W. Von Korff,** Variety Club Hospital and **Dr. E. H. Wood,** Rochester.

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Dr. John S. Pearson, Mayo Clinic, will conduct Dr. Zenya Pluzek, a clinical psychologist in practice in Poland, through the facilities of the Mayo Clinic. Doctor Pluzek is in Rochester observing techniques in clinical psychology as applied at the University of Minnesota. She has translated a number of works on the subject from English into Polish.

* * *

Cloquet physician, **Dr. Marie K. Bepko,** recently attended the Seventh Congress of the Pan-American Medical Women's Alliance, which meets every two years, this year in Central America. En route home, she stopped in Miami to attend the American Medical Women's Association and the World Medical Association United States Committee meeting.

* * *

The newly formed Minnesota-Wisconsin-Iowa Societies of Oral Surgeons recently held a two-day session in Rochester. **Dr. S. A. Lovestedt** of the Mayo Clinic was General Chairman. **Dr. O. K. McKay,** Duluth, is president-elect of the organization.

* * *

Two University of Minnesota medical leaders participated in the dedication of the new addition to the Jay Phillips Research Laboratory at Mt. Sinai Hospital in Minneapolis. They were **Dr. Owen H. Wangensteen,** Chairman of the University Surgery Department, main speaker at the public ceremonies, and **Dr. C. Walton Lillehei,** Professor of Heart Surgery, addressed a dinner gathering.

* * *

Dr. James Oliver, formerly of Moorhead, recently joined the staff of the Veterans Hospital in Minneapolis for a three-year residency. Doctor Oliver will further his study in medicine, specializing in urology at the Minneapolis Veterans Hospital under the graduate program offered by the University of Minnesota.

* * *

Dr. B. J. Cronwell, Austin, was among 130 doctors from twenty states and three foreign countries attending a one-week postgraduate course in "Recent Advances in Internal Medicine" at Peter Bent Brigham Hospital.

* * *

Dr. J. C. Cain and Mrs. Cain, Rochester, have returned from a two and one-half month trip through England, Holland, Germany, Spain, Switzerland, France, Belgium and Italy. Doctor Cain attended a medical meeting in Holland at the beginning of the trip.

* * *

Dr. Andrew G. Sathe, a former resident of Moorhead, has opened medical practice in that city. Doctor Sathe was previously employed at the Harmon Clinic in Williston, North Dakota.

* * *

Mayo Clinic staff member, **Dr. Edward M. Litin,** gave the Higgins-O'Donnell Lecture at West Point, New York.

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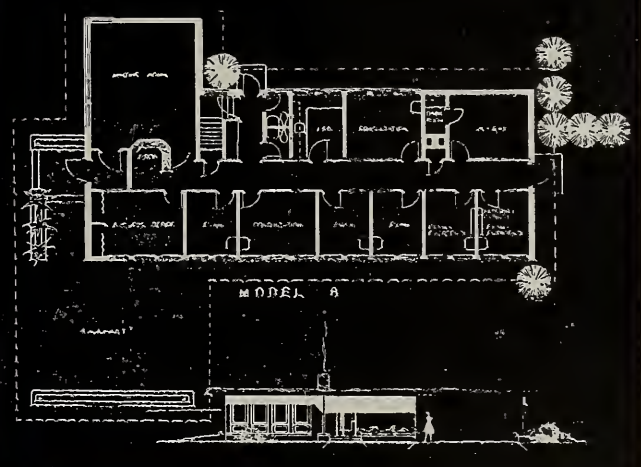
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The lecture was established four years ago as a memorial to Doctor John Higgins, of Sayre, Pennsylvania, and Doctor Francis O'Donnell, Wilkes-Barre, Pennsylvania, who were prominent in the practice of pediatrics in northeastern Pennsylvania and whose lifetime work in that field provided an impetus to the founding of the Pediatric Society of Northeastern Pennsylvania. "Psychiatry and the Family Doctor" was the title of Doctor Litin's address.

* * *

St. Olaf College in Northfield, Minnesota, recently presented **Dr. Herbert W. Schmidt**, Mayo Clinic, with an award for outstanding achievement as an alumnus of St. Olaf College. Previously Doctor Schmidt had been elected a trustee of the college.

* * *

"The Rheumatic Fever Prophylaxis Program in Minnesota" was the title of a talk given by **Dr. John O'Leary** of Brainerd at the Conference on Physicians and Schools held at Cragun's Resort on Gull Lake. The Conference was sponsored by the Minnesota Heart Association, the Minnesota Department of Health, the Minnesota Department of Education and the Minnesota Association for Mental Health. Reason for the conference was to develop health environmental standards among children of school age through discussion of specific health problems. Nutrition and diet, accident prevention, emotional and physical environment and health instruction were some of the topics of the Conference.

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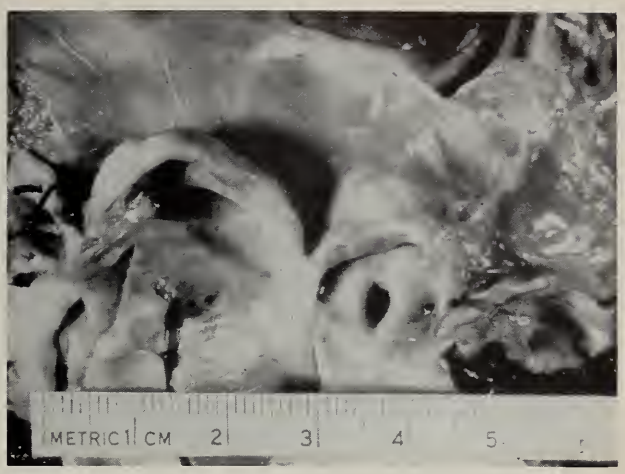


Fig. 1. Note unequal sizes of aortic cusps causing imperfect coaptation when a biscupid valve was fashioned.

Direct Surgery of Aortic Insufficiency

Including a New Method for Subcoronary Aortic Valve Substitution

JOSEPH J. GARAMELLA, M.D.
WILLIAM H. HEUPEL, M.D.
B. FAKHERY, M.D.
W. ROBERT SCHMIDT, M.D.
NATHAN KENNETH JENSEN, M.D.

Minneapolis, Minnesota

Presented at Minneapolis Academy of Medicine, Minneapolis, Minnesota, February 15, 1960.

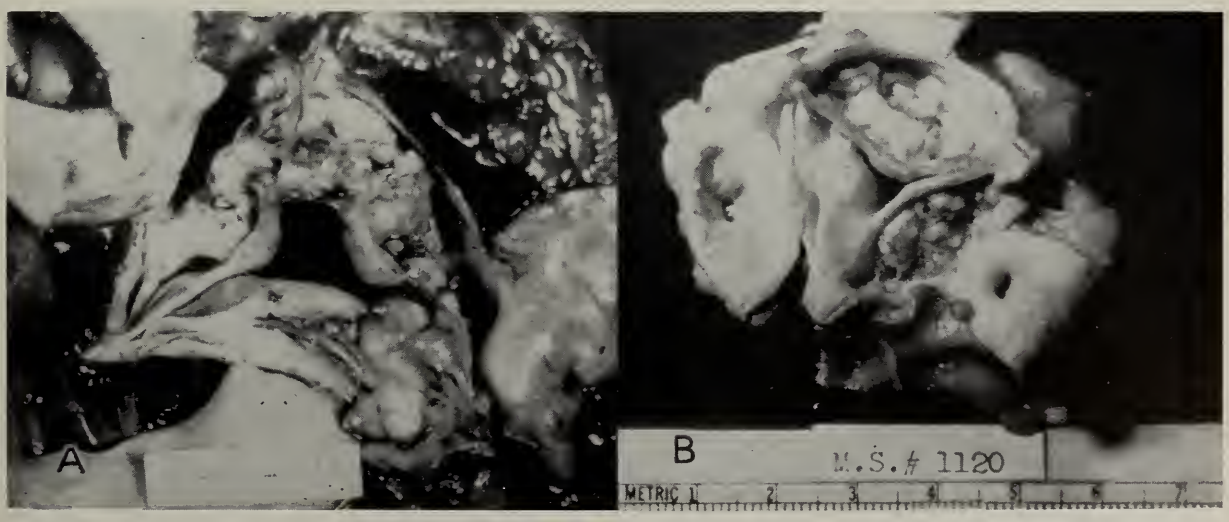


Fig. 3 a and b. Advanced disease of aortic valve with calcification and combined aortic stenosis and regurgitation.

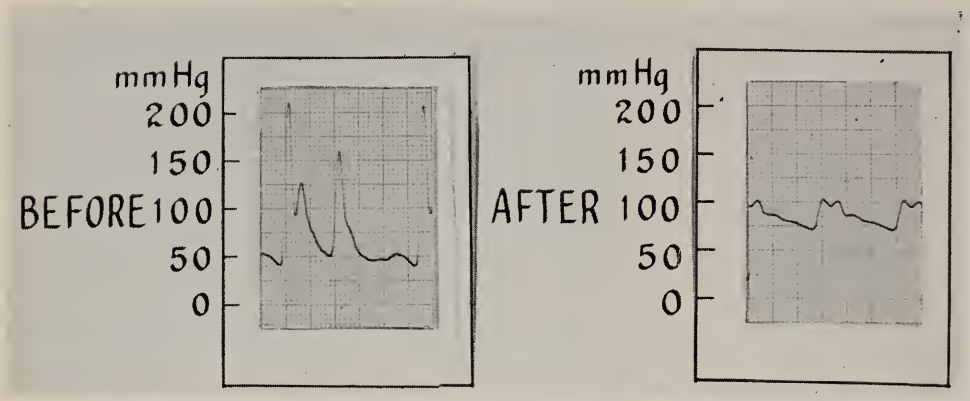


Fig. 2. Pulse curves before and after conversion of tricuspid aortic valve to bicuspid valve. Following formation of bicuspid aortic valve, the diastolic pressure rose from 35 to 75 mm. Hg.

ALTHOUGH initially open heart surgery was confined to only a few centers in this country, it was inevitable that with time and added experience these newer techniques would be practiced in many hospitals at home and abroad. Our clinical experience with the use of an extracorporeal pump oxygenator in Minneapolis private hospitals includes a variety of surgically remediable congenital and acquired forms of heart disease.

Among the most difficult of these are the stenotic and regurgitant lesions of the aortic valve. Reasons for this are immediately apparent, namely, (1) variations in pathologic anatomy, (2) limitations to correction due to pathologic anatomy, (3) the advanced stage of the disease associated with deterioration of the left ventricle when surgical intervention is considered, (4) special technical problems of cardiopulmonary bypass as air emboli follow aortotomy, the need for prolonged total body perfusion, the need for providing nourishment to the myocardium during surgical correction as by direct antegrade coronary perfusion.

Historical Background

In 1913, Tuffier[1] attempted surgical dilatation of aortic stenosis by invaginating the wall of the aorta, but surgery for aortic insufficiency remained

Supported by USPH Grant No. H-2610, John A. Hartford Foundation, Inc., and the Cardiac Research Committee, Minneapolis, Minnesota.

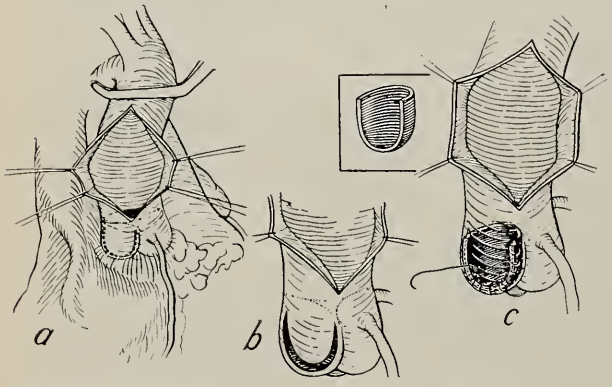


Fig. 4. Technique of aortic cusp substitution. (a) Broken line is the proposed line of incision opposite the noncoronary cusp. (b) Curvilinear incision is made through the aortic wall opposite the noncoronary cusp. (c) Cusp substitute is fitted into the curved aortic incision at the cusp level and sutured in place.

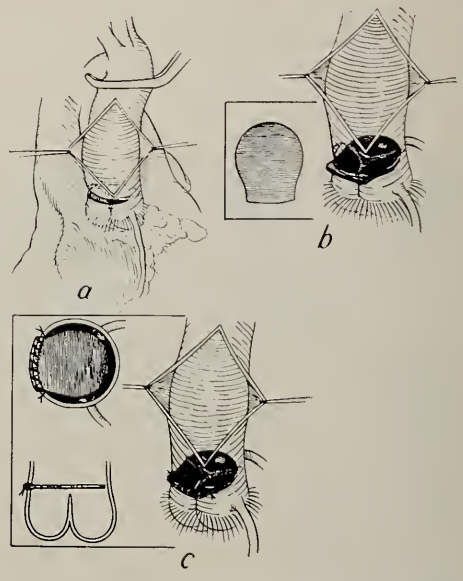


Fig. 5. Technique of supracoronary flap valve substitution. (a) Vertical aortotomy and transverse semilunar aortotomy distal to valve level. (b) A plastic flap valve is placed above aortic valve. (c) Flap sutured into position through full thickness of aortic wall.

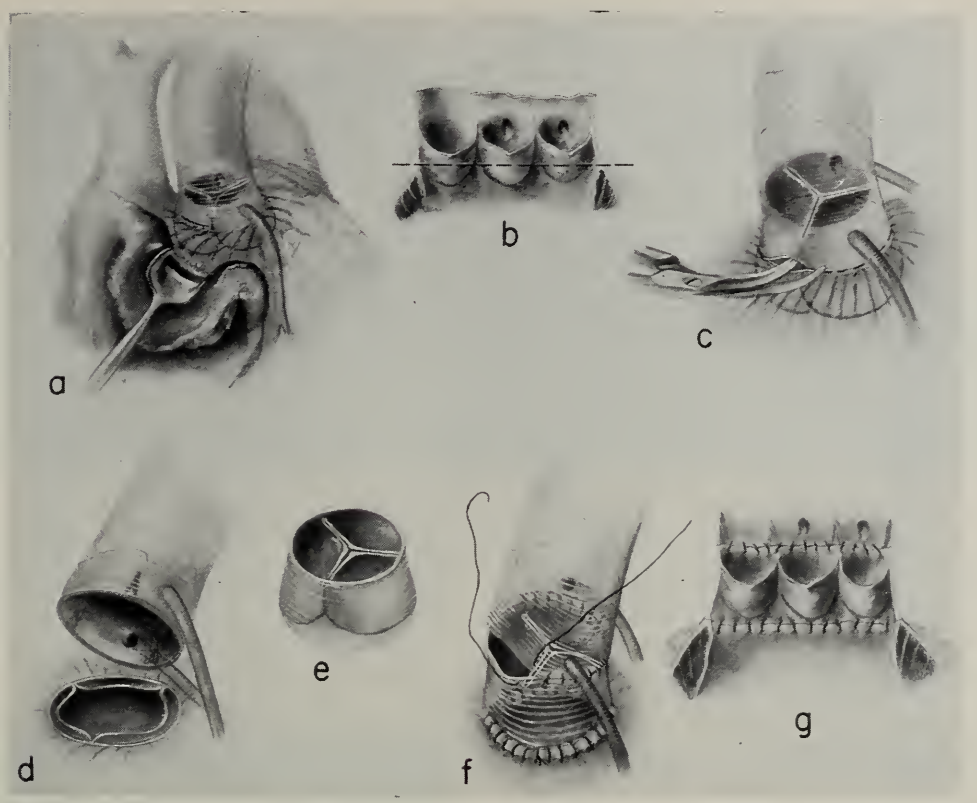


Fig. 6. Technique of subcoronary valve substitution. (a) Beginning of transection of aorta opposite the noncoronary cusp. (b and c) Level of complete subcoronary transection of aorta. (d) Aortic transection below coronary arteries completed. (e) Aortic valve substitute. (f and g) Aortic valve substitute fixed in position by direct suture anastomosis.

dormant until Campbell[2] in 1950 and Hufnagel[3] in 1951 introduced prosthetic valves in the descending part of the thoracic aorta. Other methods tried experimentally and clinically for the control of aortic regurgitation include:

(1) transplantation of homologous aortic valves in the thoracic aorta,[4,5,6] (2) fashioning of valve from intima of aorta,[7] (3) injection of sclerosing solutions at base of aorta,[8] (4) pericardial pedicles[9] and vein grafts[4] suspended above the aortic valve, (5) organic prosthesis substitutes,[10] (6) circumferential purse-string sutures of aortic annulus,[8,11] (7) supra- and subcoronary prosthetic valves.[8,12,13,14]

The ball-valve prosthesis of Hufnagel placed in the descending thoracic aorta received extensive clinical trial by him and although providing worthy palliation in a number of cases the limitations of the method are evident, such as, (1) partial control of the regurgitation because of the distal location of the artificial valve, (2) reversal of the relationships between the coronary arteries and the distally placed valve, (3) a permanent foreign body is introduced into the blood stream with possible sequelae of trauma to blood cellular elements and thrombus formation, (4) hazards of infection, aneurysm formation and rupture. Following clinical application in more than 400 patients, Hufnagel abandoned this method in favor of direct operative procedures.

The development of open heart techniques led to the direct vision attack on congenital and acquired aortic stenosis with hypothermia,[15,16] and total body perfusion,[17] and it is logical that the same approach should be applied to aortic insufficiency. Retrograde coronary perfusion[17,18] extended the operative time. Antegrade coronary perfusion[19-22] provided a method of nourishing the myocardium during exposure of the aortic valve. Hypothermia combined with perfusion[23] permits further extension of operative time. Although chemical cardioplegics as potassium citrate and acetylcholine are losing popularity, hypothermic cardiac arrest[24,25] has proved to be a satisfactory method.

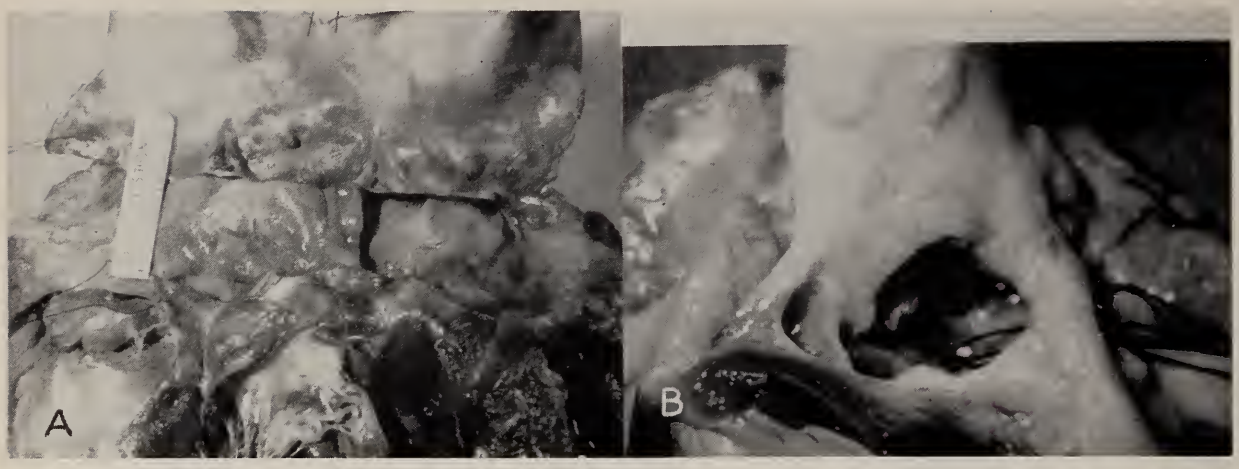


Fig. 7. *(above)* (a) In human autopsy specimen, the aorta is transected below the coronary arteries. (b) View showing a surprising stretch of the coronary arteries after the transection permitting a liberal separation of the margins of the divided aorta.

Presently, the following direct methods are being explored experimentally and clinically in the treatment of aortic insufficiency.

Direct methods of surgical correction are:

(1) conversion of tricuspid aortic valve to bicuspid valve,[26-32] (2) commisural suture to form a conjoint cusp,[17] (3) cusp restoration by suture,[17,30] (4) cusp restoration by prosthesis,[17,33] (5) cusp restoration by autogenous aortic wall,[30] (6) valve replacement, total.[8,12-14,34-36]

In previous communications, Garamella[26] and associates described a method of converting the triscuspid aortic valve to a bicuspid valve. Acute and chronic experimental studies and human post mortem anatomical studies[27-29] supported the clinical application of the method. Others (Bailey,[20,30] Lillehei,[37] Varco,[38] Hufnagel,[34] Creech,[31] Cooley,[32] and Kelly[39]) have clinically applied this method, or a modification.

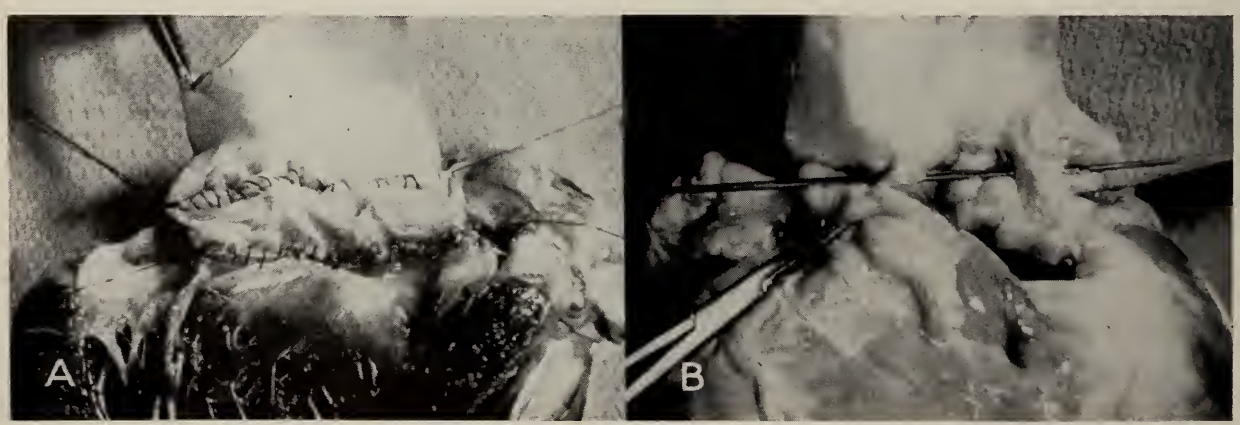


Fig. 8. Homologous aortic or pulmonic valve substitute.

Report of Cases

Our experience with this method has been limited to three cases, as follows:

Fig. 9. *(below)* (a) Substitute valve sutured in place below the coronary arteries. (b) View showing coronary arteries separated from substitute valve.



Case 1.—A forty-nine-year-old man had aortic insufficiency for many years. Two months before surgery he suffered his second bout of congestive failure. Combined right and left heart catheterization were done. Surgery was elected. At the time of pericardiotomy, a quantity of old, bloody fluid (900 cc) was present in the pericardial sac. Ventricular fibrillation occurred. Defibrillation was rapidly accomplished and the procedure was continued. A bicuspid aortic valve was formed, but sustained ventricular contractions could not be obtained after closure of the aortotomy. At autopsy, the heart weighed 750 grams. The reconstructed bicuspid valve appeared competent. Severe coronary disease and multiple, old infarcts were present.

Case 2.—A thirty-seven-year-old woman had known aortic insufficiency for several years. She developed sudden congestive failure and after rigid medical management was sent home for an additional six week period prior to surgery. During this period she again developed congestive failure. Following a suitable period of preparation surgery was undertaken. A bicuspid aortic valve was formed without difficulty. Failure followed, however, due to unequal sizes of the remaining aortic cusps and imperfect coaptation resulting in residual aortic incompetence (Fig. 1).

Case 3.—The patient was a thirty-three-year-old man who was found to have a heart murmer at age 16 when entering the Armed Forces. He was rejected for duty.

In May, 1959, he developed a febrile illness and subsequently subacute bacterial endocarditis with clinical aortic insufficiency. His clinical course was progressively downhill in spite of rigid medical management. He continued to have nocturnal dyspnea. Cardiac catheterization showed elevated wedge and pulmonary artery pressures. Surgery was elected.

A fenestrated non-coronary cusp was found and excised. A bicuspid valve was nicely fashioned. The postoperative blood pressure was 105/75, preoperative 175/35 (Fig. 2). Unfortunately, this patient died on the first postoperative day from air emboli.

In some instances, as in the second case described, and as shown in Figure 3a and b, the nature of the pathology causing aortic incompetence ideally demands partial or total valve substitution. A number of investigators have reported experimental methods of total valve substitution and indeed there are isolated reports of clinical use.[35,36] However, due to unresolved physiologic and technical problems, this procedure is not ready for broad clinical application.

One of the chief obstacles to success has been loss of valve function due to thrombosis following insertion. In addition, a method of fixation of the valve below the coronary arteries has proved difficult. To minimize these problems, several alternate methods of partial and total aortic valve substitution are under investigation and are schematically shown in Figures 4, 5, and 6. Anatomic studies are shown in Figures 7a and b, 8, 9a and b, and 10.



Fig. 10. Plastic valve substitute sutured in subcoronary position.

Operations were performed with cardiopulmonary bypass and total body perfusion supplemented with antegrade coronary artery perfusion or hypothermic cardiac arrest. Preliminary experiments indicate that this method of total aortic valve substitution is feasible. Animal hearts have resumed function following total valve substitution, the longest for fifty-two minutes. The principal cause of failure has been bleeding at the line of anastomosis. The anatomy is such as to make the anastomosis technically difficult. Continued experience with the method may eliminate this shortcoming.

Summary and Conclusion

1. In a variety of congenital and acquired lesions encountered in open heart surgery, those of the aortic valve are among the most difficult.

2. Advances in techniques of open heart surgery have permitted a direct vision attack for correction of aortic insufficiency.

3. Available surgical methods for dealing with this problem are mentioned.

4. It is apparent that the choice of surgical procedure employed will be largely modified by the pathologic anatomy producing the aortic insufficiency, such as (1) annular dilatation, (2) cusp prolapse, (3) cusp shortening, (4) cusp fenestration, (5) cusp laceration.

5. Several original techniques for inserting partial and total aortic valve substitutes in the supracoronary and subcoronary positions are described.

References

1. Tuffier, T.: Etat actuel de la chirurgie intrathoracique. Tr. Internat. Cong. Med., London, 1913. Surgery, 2:249, 1914.
2. Campbell, J. M.: An artificial aortic valve; preliminary report. J. Thoracic Surg., 19:312, 1950.
3. Hufnagel, C. A.: Aortic plastic valvular prosthesis bulletin. Bull. Georgetown Univ. M. Center, 3:128, 1951.
4. Lam, C. R., Aram, H. H., and Munnell, E. R.: An experimental study of aortic valve homografts. Surg. Gynec. & Obst., 94:129, 1952.
5. Murray, G., Roschlau, W., and Lougheed, W.: Homologous aortic valve-segment transplants as surgical treatment for aortic and mitral insufficiency. Angiology, 7:466, 1956.
6. Garamella, J. J., George, V. P., and Hay, L. J.: A correlative study of peripheral coronary pressures and coronary arteriography following coronary occlusion. Surg. Gynec. & Obst., 105:89, 1957.
7. Castro-Villagrana, B., Sisteran, A., and DeBakey, M. E.: An experimental surgical treatment of aortic insufficiency. S. Forum, 8:371, 1957.
8. Bailey, C. P.: Surgery of the Heart. Philadelphia: Lea and Febiger, 1955.
9. Bailey, C. P., Glover, R. P., O'Neill, T. J. E., and Ramirez, H. P.: Experiences with the experimental surgical relief of aortic stenosis. J. Thoracic Surg., 20:516, 1950.
10. Litwak, R. S., Gadboys, H. L., Scott, G. B., and Ferrarar, J. F.: Surgical approach for stenotic lesions of the semilunar valves by excision and cusp replacement under direct vision. J. Thoracic Surg., 24:165, 1952.
11. Taylor, W. J., Thrower, W. B., Black, H., and Harken, D. E.: The surgical correction of aortic insufficiency by circumclusion. J. Thoracic Surg., 35:192, 1958.
12. Wible, J. H., Jacobson, L. F., Jordan, P., Jr., and Johnston, C. G.: The correction of aortic insufficiency with a spring valve prosthesis. A.M.A. Arch. Surg., 74:929, 1957.
13. Roe, B. B., Najarian, J. S., and Moore, D.: A technic for insertion of a flexible aortic valve prosthesis into the ascending aorta. Ann. Surg., 145:388, 1957.
14. Malette, W. G., Summers, W. B., and Eiseman, B.: Experimental problems in construction of subcoronary prosthetic aortic valves. S. Forum, 7:233, 1957.
15. Swan, H., and Kartz, A. B.: Direct vision transaortic approach to the aortic valve during hypothermia: Experimental observation and report of successful clinical case. Ann. Surg., 144:205, 1956.
16. Lewis, F. J., Shumway, N. E., Niazi, S. A., and Benjamin, R. B.: Aortic valvulotomy under direct vision under hypothermia. J. Thoracic Surg., 30: 598, 1955.
17. Lillehei, C. W., Gott, V. L., DeWall, R. A., and Varco, R. L.: The surgical treatment of stenotic or regurgitant lesions of the mitral and aortic valves by direct vision utilizing a pump-oxygenator. J. Thoracic Surg., 35:154, 1958.
18. Blanco, G., Adam, A., and Fernandez, A.: A direct experimental approach to the aortic valve. Acute retroperfusion of the coronary sinus. J. Thoracic Surg., 32:171, 1956.
19. Blanco, G., Oca, C., Laguna, S., Nunez, L. E., Schaefer, J. J., and Bailey, C. P.: The use of autogenous lung with an extracorporeal pump system in clinical cardiac bypass. Am. J. Cardiol., 3:6, 1959.
20. Bailey, C. P., and Zimmerman, J.: The surgical correction of aortic regurgitation. Am. J. Cardiol., 3:6, 1959.
21. Bailey, C. P., and Zimmerman, J.: Aortic Regurgitation. In Encyclopedia of Thoracic Surgery (edited by E. Derra). Berlin: Springer-Verlag, 1959.
22. Kay, E. B., Head, L. R., and Nogueria, C.: Direct coronary artery perfusion for aortic valve surgery. J.A.M.A., 168:1767, 1958.
23. Brown, I. W., Smith, W. W., Young, G. W., and Sealy, W. C.: Experimental and clinical studies on controlled hypothermia rapidly produced and corrected by a blood heat exchange during extracorporeal circulation. J. Thoracic Surg., 36:487, 1958.
24. Cross, F. S., Jones, R., and Berne, R. M.: Localized cardiac hypothermia as an adjunct to elective cardiac arrest. S. Forum, 8:355, 1957.
25. Long, D. M.: Personal communication.
26. Garamella, J. J., Andersen, J. G., Oropeza, R., Jensen, N. K., Hay, L. J., and Naidu, R.: A new concept in the surgical treatment of aortic insufficiency. Minnesota Med., 41:260, 1958.
27. Garamella, J. J., Andersen, J. G., and Oropeza, R.: The surgical treatment of aortic insufficiency by open plastic revision of the tricuspid arotic valve to a bicuspid valve. Surg. Gynec. & Obst., 106:697, 1958.
28. Garamella, J. J., Andersen J. G., Oropeza, R., Veloso, A., Naidu, R. and Hay, L. J.: Surgical treatment of aortic insufficiency by open plastic revision of the tricuspid aortic valve to a bicuspid valve. S. Forum, 9:329, 1959.
29. Garamella, J. J., Andersen, J. G., Oropeza, R., Veloso, A., and Naidu, R.: The surgical treatment of aortic insufficiency by conversion of the tricuspid aortic valve to a bicuspid valve. Chron. Experimental studies. J. Thoracic Surg., 37:177, 1959.
30. Bailey, C. P., Zimmerman, J., Blanco, G., and Sparger, C. F.: Surgical correction of aortic regurgitation. A.M.A. Arch. Surg., 80:16, 1960.
31. Creech, O. J.: Treatment of aortic insufficiency. Bull. Tulane M. Faculty, 17:73, 1958.
32. Cooley, D. A., Collins, H. A., Giacobine, J. W., Morris, G. C., Jr., Soltero-Harrington, L. R., and Harberg, F. J.: The pump oxygenator in cardiovascular surgery: Observations based on 450 cases. Am. Surgeon, 24:870, 1958.
33. Hufnagel, C. A.: Direct approaches for the treatment of arotic insufficiency. Am. Surg., 25:321, 1959.
34. Hufnagel, C. A., Villegas, P. D., and Nahas, H.: Experiences with new types of aortic valvular prostheses. Ann. Surg., 147:636, 1958.
35. Muller, Wm. H.: Surgical treatment of aortic insufficiency. Am. Heart Assn. 3rd Annual Scientific Session. Philadelphia: October, 1959.
36. Long, D. M., Stearns, L. P., DeReimer, R., Warden, H. E., and Lillehei, C. W.: Subtotal and total replacement of the aortic valve with plastic valve prostheses. Surg. Forum (Am. Coll. Surg.) 1959. (In press).
37. Lillehei, C. W.: Personal communication.
38. Varco, R. L.: Personal communication.
39. Kelly, Wm.: Personal communication.

CLASSIFICATION

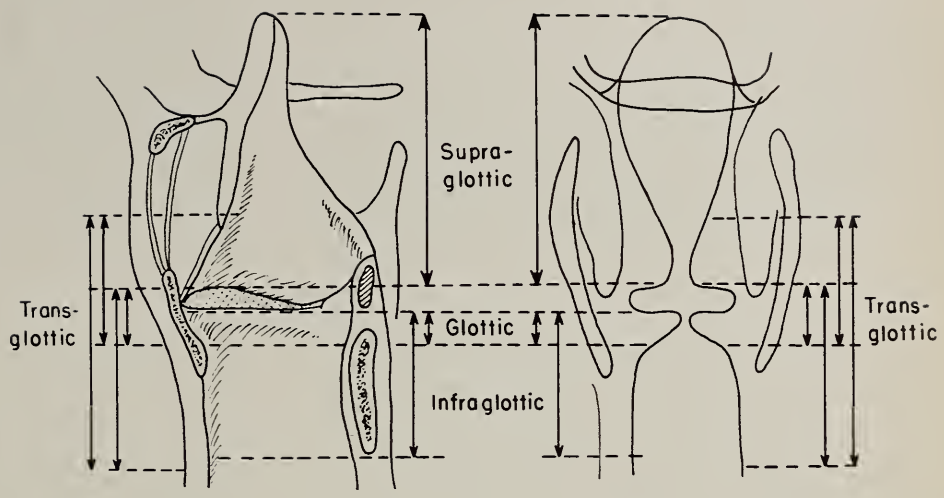


Fig. 1.

Cancer of the Throat

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TO THE AVERAGE practitioner in medicine, a primary malignant lesion in the anatomic area of the throat has been difficult to visualize and requires the use of special instruments or other visual aids. Unless symptoms are obstructive or painful, usual complaints arising from tumors in this area of the lower pharynx, upper esophagus and larynx are vague. It is distressing that symptoms often are allowed to remain for months and late appearance of palpable masses in the lateral neck then directs the attention of the physician to the primary location.

Once the disease is suspected and confirmed there has been an aura of hopelessness attached to eventual outcome from treatment of such tumors in these locations with a distinct separation between palliation irradiation and radical removal of the larynx. Except for small lesions of the true cord where conservation and a socially acceptable operative procedure can be performed with a high cure rate, present day trends have been towards increasing radical operation methods. Radiation therapy for lesions of the pharynx and esophagus has yielded fair results for cure in the hands of the experienced radiotherapist. For others, palliation is the usual result.

It has only been relatively recent that for extensive lesions of the larynx and pharynx surgical

TABLE I. TREATMENT OF LARYNGEAL CANCER

Intrinsic (glottic, stage I)	Irradiation Laryngofissure Hemilaryngectomy
Endolaryngeal (glottic, stage II, III)	Laryngectomy and neck dissection
Subglottic (subglottis stage II, III)	Laryngectomy and neck dissection
Extrinsic with cordal or arytenoid involvement (supraglottic or laryngopharyngeal stage II, III)	Laryngectomy and neck dissection
Postcricoid or pyriform sinus extension into esophagus	Laryngo-pharyngo-esophagectomy and neck dissection
Epiglottic without cordal invasion (supraglottic cancer stage II, III)	Supraglottic subtotal laryngectomy and neck dissection
Epiglottic without cordal invasion: base of tongue invaded (supraglottic cancer stage II, III)	Extended supraglottic subtotal laryngectomy and neck dissection
Pyriform sinus without cordal-arytenoid involvement, or posterior hypopharyngeal wall (laryngopharyngeal or hypopharyngeal cancer)	Trans-hyoid partial laryngo-pharyngectomy and neck dissection

treatment has been either laryngectomy or combined with extended pharyngeal surgery. When tumor occurs between the larynx and pharynx, many surgeons prefer to remove the larynx in order to remove a tumor of the pharynx, even though the larynx is minimally or questionably involved. The problems of reconstruction and restitution of function are great and it has been easier to remove the larynx than to conserve function.

The purpose of presenting this paper is to bring to your attention some newer techniques and methods of approaches for the treatment of cancer of the pharynx and larynx and esophagus. It is the author's opinion that preservation of "normal" speech and swallow can be maintained in many cancers of this area. Formerly, laryngectomy and neck dissection would have been the treatment of choice, but accuracy of localization leaves a sharp distinction between radical destructive surgery and a conservative operation that is just as radical.

Pathology

In over 95 per cent of the lesions of the pharynx and larynx the tumor is squamous cell cancer. The incidence of nodal metastases from such a lesion varies according to location. Recently we have published our observations of nodal metastases associated with certain primary characteristics of cancer of the larynx. I shall summarize the finding of ninety-six consecutive cases of cancer of the larynx confirmed between 1950 and 1959. We classified the lesions according to (1) Glottic cancers limited to the true cord, (2) Infraglottic cancers of the subglottis and glottis, (3) Supraglottic cancers involving the false cord, fixed cord and free portion, (4) Transglottic cancers across the ventricle thus involving two or three of the other sites. The rare ventricle tumors are included in this group (Fig. 1).

There was a progressive increase in metastatic rate from glottic, infraglottic, supraglottic and transglottic—0, 19, 33 and 52 per cent respectively. The metastatic rate of the transglottic group represents the addition of the infraglottic and supraglottic, confirming the expected results derived from the theoretical considerations of the lymphatic drainage of the larynx. The transglottic group yielded a higher incidence of clinical apparent and inapparent metastases. The metastatic rate for the inapparent metastases for the infraglottic group was 22 per cent, the supraglottic 4 per cent and the transglottic 31 per cent. Supraglottic and infraglottic cancers larger than 2 cms. of moderate or poor differentiation constitute a high incidence of metastases. Cancers of these two locations that are well differentiated of any size; those of 2 cms. or less and moderately or poorly differentiated provide a poor yield of metastases. Of twenty-three patients with supraglottic or transglottic cancers, those who have cervical metastases initially, eleven (48 per cent) had proved positive nodes in the contra-lateral side of the neck on follow up surgery. Consideration in these cases should be given to bilateral neck dissection (one or two stage). Supraglottic tumors appear to be the pushing type rather than infiltrating, particularly when they are well differentiated.

Those cases of laryngeal cancer can be separated into groups with low or high metastatic rate by using pre-operative information about site, size, biopsy, differentiation, and clinical evaluation of cervical nodes. The pyriform sinus and posterior wall of the pharynx are known for their high incidence of cervical metastases. They are usually of moderate or poor differentiation and the tumors are usually two centimeters or larger.

TABLE II. LARYNGECTOMY AND NECK DISSECTION CONSECUTIVE PATIENTS TREATED BY ONE STAGE SURGERY
(Five year results of fifty-nine patients operative mortality three per cent)

	Endolaryngeal	Subglottic	Extrinsic
Total cases	18	13	28
Postoperative death	1	1	0
5-12 years	10/17-59%	7/12-59%	9/28-32%
No follow-up	1	1	3
Elective neck series	9/13-69%	7/12-59%	5/14-36%

Symptomatology

Except for a tumor that arises from the true cord where hoarseness is manifest early, tumors of the epiglottis and pyriform sinus do not exhibit many symptoms until they are large. Often the enlarged palpable node is the first indication that something is wrong with the patient. Cancers of the base of the tongue and vallecula are occasionally silent. Many of the complaints can be grouped under the loose diagnosis of "globus hystericus," a lump in the throat, scratchy sensation in the throat, a sensation of irritation, changes in drinking habits, that is, preference for warm beer rather than cold beer. Such complaints may be overlooked by the physician unless one looks at the parynx by indirect or direct means. Pain referred to the ear is a frequent complaint of a lesion in this area. Dysphagia is manifest when a tumor involves the esophagus, and dyspnea when the tumor is so bulky as to restrict the airway.

Diagnosis

It is of utmost importance that size and extent of tumor be accurately noted since treatment depends to a great extent upon an accurate evaluation. Clinical estimation of extent is fraught with many errors. While a rough estimate can be made as to size, we have recently demonstrated that the laryngogram is extremely accurate in localizing the tumor. For example, by laryngogram the accuracy of localizing ninety-nine such lesions both as to size and extent and neighborhood structures was 92 per cent compared to 78 per cent by indirect and direct examination. Direct laryngoscopy and esophagoscopy with biopsy is necessary to establish the true nature of the disease.

Treatment

After the biopsy has been made and we are dealing with squamous cell cancer, the following has been our recommended treatment. If one refers to the Table I little discussion will concern the treatment of glottic cancer restricted to one cord. In our hands small glottic cancers have been very successfully treated by irradiation (92 per cent five year cure rate). I would hesitate to recommend radiation therapy when a skilled radiotherapist is not available. With lesions involving the cord and subglottis or supraglottic lesion extending to or below the anterior commissure, the only treatment is laryngectomy and neck dissection.

Conservation of laryngeal function operations can be performed in one-third of the laryngeal and pharyngeal cases when they are first seen. In a classic example of the epiglottic lesion, the operation which removes this structure can be extended for those lesions in the anterior pyriform sinus or the base of the tongue in continuity with neck dissection. For moderate or small lesions of the pyriform sinus, we have routinely resected the pyriform sinus together with the thyroid cartilage and arytenoid with reconstruction of the pharynx. One leaves only a flaccid true cord which is now paralysed by removal of the arytenoid. The pharynx is reconstructed with or without a skin graft, and with or without a stent. Lesions involving the entire posterior wall may also be resected and reconstructed with a large split thickness graft without sacrificing the larynx. No attempt is made to compromise function at the expense of leaving tumor. The selection of cases has been based purely on location and extent of removal which often includes parts of the larynx. This has been determined by laryngogram and direct laryngoscopy. It is surprising how much of the entire supraglottic area of the larynx may be removed and the patient is still able to speak and swallow. The portion of the larynx that may be left in the most extensive resection consistent with conservation of function is the lower half of the thyroid cartilage, one functioning true vocal cord and one arytenoid. With only this as protective mechanism, the patients are able to swallow and speak with slight difficulty. Occasionally on the very extensive resections when the larynx has been left there is a compromise as to the quality of the food the patient can eat, for example, when the opening of the esophagus is resected some of

the patients can only swallow soft foods and have to wash down large particles of meat with fluids. When a large area of the posterior pharynx has been resected and grafted with skin, this may also have some side effects such as accummulation of mucus which the patient must clear from the throat.

Results

The results of the elective neck dissection with laryngectomy have yielded an increased five year cure rate over total laryngectomy alone (Table II). Since the development of partial laryngectomies, that is, supraglottic subtotal, or trans-hyoid laryngo-pharyngectomy with neck dissection has only been done during the past six years, it is not possible to discuss five-year results.

There has been a total of forty-two patients in this group. In thirty instances, the epiglottis or base of the tongue have been resected. In twelve, the pyriform sinus or posterior wall section with reconstruction has been done. In only one instance has there been local recurrence and this case was with a tumor in the base of the tongue.

The majority of these cases are extending into their second and third year. To the patient it makes a great deal of difference whether function can be preserved and he can return to his position in society. In another two years one should be able to state whether the cure rate is high enough to warrant this conservation approach. On the whole, local recurrence is rare, contra-lateral metastasis has occurred in 10 per cent, and 50 per cent survival without disease for those beyond two years.

It is difficult to compare results of the method which I have developed to that of Alonso. Alonso has left a permanent pharyngostome requiring secondary reconstruction, while I have done immediate reconstruction in all instances. Furthermore, neck dissection is not routine with Alonso; it has been standard practice for all of our cancers in these locations. In a small series, Alonso reports 30 per cent cure rate in pharynx and hypopharynx lesions. This is quite close to our five-year survivals to total laryngectomy and neck dissection for pyriform cancer. I would reasonably expect that our conservation operation results will parallel or improve on this. Anyone with experience knows that if a case survives past the second year, nearly 80 per cent of these cases have been salvaged and will live to a five-year period.

References

Ogura, J. H., and Bello, J.: Laryngectomy and radical neck dissection for carcinoma of the larynx. Laryngoscope, 62:1, 1952.

Ogura, J. H.: Supraglottic subtotal laryngectomy and radical neck dissection for carcinoma of the epiglottis. Laryngoscope, 68:983, 1958.

Ogura, J. H.: Cancer of the larynx, pharynx and upper esophagus—five year results of laryngectomy and radical neck dissection for laryngeal cancer accepted for publication. Arch. Otolaryngol., 1960.

Ogura, J. H.: Surgical pathology of cancer of the larynx. Laryngoscope, 65:867, 1955.

McGavran, M. H., Bauer, W. C. and Ogura, J. H.: The incidence of cervical lymph node matastases from epidermoid carcinoma of the larynx and their relationship to certain characteristics of the primary tumor. A study based on the clinical and pathologic findings in 96 patients treated by en bloc laryngectomy and radical neck dissection. (To be published in Cancer, 1960.)

Ogura, J. H., Powers, W. E., Holtz, S., McGavran, M., Ellis, B., and Voorhees, R.: Laryngograms, their value in the diagnosis and treatment of laryngeal lesions—A study based on clinical, radiographic and pathologic findings on 99 patients with cancer of the larynx. Laryngoscope, 1960.

Ogura, J. H.: Laryngectomy and Lateral Pharyngotomy —Surgical Treatment of Extensive Cancers of the Larynx, Pharynx and Esophagus-Radical and Conservative Operations in the Larynx and Pharynx with Immediate Reconstruction. W. Prior Otolaryngology Vol. 5. (In press.)

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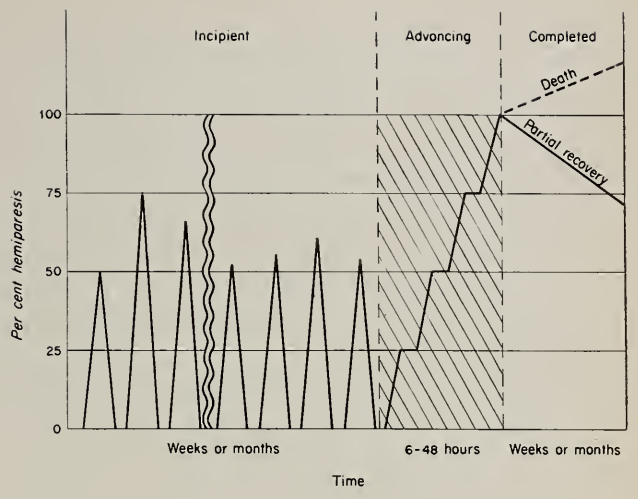


Fig. 1. Phases of stroke due to occlusive cerebrovascular disease. The stroke may begin at any point on this graphic representation of the progression of focal cerebral ischemia; an advancing stroke may reach completed status at any level of disability.

Cerebral Infarction and Fibrinolytic Agents

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CLINICAL evaluation is our major concern in this paper; however, we accept the necessity of adequate laboratory control to add weight to clinical observations, which aspect has been covered by other authors.[1] We have no meaningful figures to demonstrate the efficacy or lack of efficacy of fibrinolytic agents in occlusive cerebrovascular disease, but we should like to call attention to how we think of strokes due to occlusive cerebrovascular disease and to try to relate this to the potential of fibrinolytic agents in the treatment of these conditions. We classify strokes due to occlusive cerebrovascular disease into three temporal categories depending on the state of the patient and his neurologic deficit at the time he is observed by the physician.

Classification of Strokes

Incipient or Impending Stroke.—The first category, the incipient or impending stroke, is represented by episodes of intermittent insufficiency or intermittent focal cerebral ischemia. Between the episodes the patient is normal or nearly normal. These episodes may last a few minutes or, at the most, an hour or so, and they may occur intermittently over several months before a catastrophic episode occurs. They may occur in the distribution of the carotid arterial system or in the vertebral-basilar arterial system.

Advancing Stroke.—The second category is the advancing stroke (slow stroke or stroke in evolution) in which the physician is able to determine that the patient's neurologic deficit is increasing during his observation. This progressive infarction also may occur in either the carotid or the vertebral-basilar system.

Completed Stroke.—The third category is the completed stroke which may occur in either the carotid or vertebral-basilar arterial system. In this

category the neurologic deficit is no longer progressing but is stable. Spontaneous improvement may occur without treatment; in fact, it is to be expected.

These three categories are demonstrated graphically in the accompanying figure.

Treatment

In the incipient stroke, that is, in patients having intermittent episodes of focal cerebral ischemia, the presumption is that the basic pathologic process is atherosclerotic narrowing of an artery with some associated clotting defect; and perhaps at times, hypotension, polycythemia, anemia, or other factors play a role.

Patients having incipient strokes have been treated with anticoagulants with apparent success;[2] recently, in selected cases, surgical correction of stenosed arteries has proved successful.[3] Fibrinolytic agents would seem to be of little value in this category since more than short-term administration of treatment is needed and, at this time, prolonged use of these agents does not seem reasonable and may even be harmful.

Advancing strokes may offer an area for more potential gain from fibrinolytic therapy. Time is the important factor in treatment for such progressing infarction. A few hours, or often less time, may allow severe and irreversible infarction to occur. One is unable to procrastinate if any treatment is going to be effective. Anticoagulants[4] have been helpful in treatment of advancing strokes, but there is room for improvement of treatment, judging from our experience so far.

The time required for lysis of an arterial clot by fibrinolytic agents administered intravenously is probably too long for optimal benefit in cases of advancing stroke. Direct injection of a fibrinolytic substance into an occluded artery may be more desirable and may yield more certain lysis of an intra-arterial thrombus.

Most, if not all, reported cases in which fibrinolytic agents had been used in treatment were those of patients having completed strokes. Unfortunately in such instances, the infarction is established and elimination of the occlusion is not likely to alter the established infarct.

At necropsy Yates[5] studied the entire carotid and vertebral arterial systems of 100 patients who had manifested some clinical evidence of cerebral ischemia. He found seventy-four cerebral infarcts in thirty-five cases, and only twenty-two of these infarcts could be accounted for by occlusion or even by stenosis of an appropriate local artery. In the 100 necropsies he found occlusion or greater than 50 per cent stenosis in fifty-seven vertebral arteries and seventy-seven carotid arteries. The important point, however, is that in this whole group he found thrombosis as a part of occlusion or stenosis in only six vertebral arteries and fifteen carotid arteries; in all other cases occlusion or stenosis was due to atherosclerosis. This demonstrates the limitations with which we are dealing in a particular instance of cerebral ischemia.

TABLE I. NATURAL HISTORY: OUTCOME OF UNTREATED CEREBRAL INFARCTION IN CAROTID SYSTEM[7]

Status	Patients	
	Number	Per Cent
Asymptomatic	25	12
Able to work (monoparesis or hemiparesis, grade 1*)	33	16
Unable to work (hemiparesis, grade 2 or 3*)	76	38
Permanent invalid (hemiparesis, grade 4*)	41	20
Dead	29	14
Total	204	100

*Graded on a basis of one (mild) to four (severest).

Evaluation of Use of Fibrinolytic Agents

Two methods by which we can attempt to evaluate fibrinolytic agents in occlusive cerebrovascular disease, whether we are considering incipient strokes, advancing strokes, or completed strokes, are as follows: (1) by comparison of the patient's clinical course after therapy with the course of a control group, and (2) by arteriographic determination of the flow of blood in arteries related to the cerebral ischemia. We will relate evaluation of fibrinolytic agents to completed strokes since, up to this time, this type of stroke is the only type reported[6] in which fibrinolytic agents have been used. It is not this type, however, which is likely to receive much benefit from these agents.

In evaluation of the patient's clinical course after therapy, we may compare our results with results obtained for control patients or, more simply, with results in our past experience in a particular category. For example, a previous study of the natural history[7] of clinically diagnosed infarction in the carotid arterial system revealed that 12 per cent of the patients become asymptomatic, 14 per cent of the patients die, 20 per cent are permanent invalids and 16 per cent have only a mild neurologic

deficit (Table I). Thirty-eight per cent of the patients are in between these categories. From these findings, one can readily see that drawing conclusions purely from clinical observation in a single instance or in a few instances will not shed much light on this problem. The course is too variable.

Secondly we may evaluate the flow of blood by arteriographic means and demonstrate when an artery is occluded after a cerebral ischemic episode. It is necessary, however, to be cautious in declaring that intracranial arteries are occluded when they do not fill with contrast media, particularly when they are viewed after a single injection. When fibrinolytic treatment is used, if it is effective, another arteriogram should show that the arterial occlusion has been eliminated. We would reiterate, however, that in cases of completed infarction little or nothing can be accomplished, in so far as neurologic deficit is concerned, by elimination of the occlusion. If the neurologic deficit is mild after a completed infarct, and if it is possible to eliminate the occlusion and maintain patency of the vessel, protection of the patient from additional trouble later may have been accomplished. In such instances, treatment with fibrinolytic agents may offer an advantage over current surgical treatment since it could also be directed toward intracranial thrombotic occlusions.

One must be cautious in assuming lysis of an embolic clot fragment as determined by an arteriogram made subsequent to treatment since it is not uncommon for embolic fragments to move or for lysis to occur spontaneously.

We have tried the arteriographic approach to evaluation of therapy in a few cases with intravenous infusion of 50,000 to 100,000 units of plasmin (Actase*) over a period of two to three hours. In most instances, the preparation was given on two successive days. Thus far we have not been successful in demonstrating lysis of an intra-arterial clot by such an intravenous infusion.

By way of example, we had a patient who experienced a sudden onset of hemiplegia and aphasia on the right side. An arteriogram demonstrated occlusion of the left internal carotid artery. Infusion of plasmin was started soon after the arteriogram was completed. Complications, that is, chills and fever and a drop in blood pressure some hours later, developed owing to the infusion. We were unable to demonstrate a significant change in the prothrombin time, concentration of fibrinogen in the plasma, or time required for lysis of an euglobulin clot in comparing blood obtained prior to and immediately after the infusion. The patient died after the second day of treatment, but his death probably was not related to the infusion since he had a rather massive cerebral infarct. Necropsy revealed a fresh thrombus still in place in the internal carotid artery which indicated that the intravenous infusion in this instance did not alter the internal carotid thrombosis.

*Our supply of actase was obtained through the courtesy of the Ortho Pharmaceutical Corporation, Raritan, New Jersey.

Summary

When the treatment of occlusive cerebrovascular disease with fibrinolytic agents is considered, it is imperative to keep in mind the limitations of ischemia in the end-organ, that is, the brain. The following two areas of occlusive cerebrovascular disease deserve thorough study in regard to treatment with fibrinolytic agents: (1) advancing or progressing infarction due to thrombosis which may be altered if lysis can be accomplished within a short time; and (2) mild neurologic deficit existing after a completed infarct since the patient may be given protection from future additional neurologic deficit if an occlusion related to the infarct can be eliminated.

References

1. Sherry, Sol, Fletcher, A. P., and Alkjoersig, Norma: Fibrinolysis and fibrinolytic activity in man. Physiol. Rev., 39:343, 1959.
2. Millikan, C. H., Siekert, R. G., and Shick, R. M.: Studies in cerebrovascular disease. III. The use of anticoagulant drugs in the treatment of insufficiency or thrombosis within the basilar arterial system. Proc. Staff Meet., Mayo Clin., 30:116, 1955.
3. De Bakey, M. E., Crawford, E. S., and Fields, W. S.: Surgical treatment of lesions producing arterial insufficiency of the internal carotid, common carotid, vertebral, innominate and subclavian arteries. Ann. Int. Med., 51:436, 1959.
4. Millikan, C. H., Siekert, R. G., and Whisnant, J. P.: Anticoagulant therapy in cerebral vascular disease—current status. J.A.M.A., 166:587, 1958.
5. Yates, P. O.: Pathological changes following proximal vertebral arterial stenosis. Proc. Roy. Soc. Med., 50:663, 1957.
6. Sussman, B. J., and Fitch, T. S.: Thrombolysis with fibrinolysis in cerebral arterial occlusion: The role of angiography. Angiology, 10:268, 1959.
7. Millikan, C. H.: Evaluation of carbon dioxide inhalation for acute focal cerebral infarction. A.M.A. Arch. Neurol. & Psychiat., 73:324, 1955.

TABLE I. A COMPARISON OF THE AGE AND SEX INCIDENCE OF MALIGNANT HYPERTENSION AND CHRONIC GLOMERULONEPHRITIS

Age Years	Total Cases	Malignant Hypertension			Chronic Glomerulonephritis			Per Cent Due To	
		M	F	Total	M	F	Total	Hypertension	Glomerulon.
0-10	18	0	0	0	10	8	18	0.0	100.0
10-20	55	2	5	7	24	24	48	12.7	87.3
20-30	116	9	13	22	66	28	94	19.9	81.1
30-40	161	37	58	95	41	25	66	59.0	41.0
40-50	233	104	65	169	41	23	64	72.5	27.5
50-60	248	155	48	203	29	16	45	81.8	19.2
60-70	153	96	39	135	15	3	18	88.2	11.8
70-80	80	43	22	65	8	7	15	81.2	19.8
80-100	12	9	3	12	0	0	0	100.0	0.0
Total	1076	455	253	708	234	134	368		

Clinical and Pathological Distinctions between Chronic Glomerulonephritis and Malignant Hypertension

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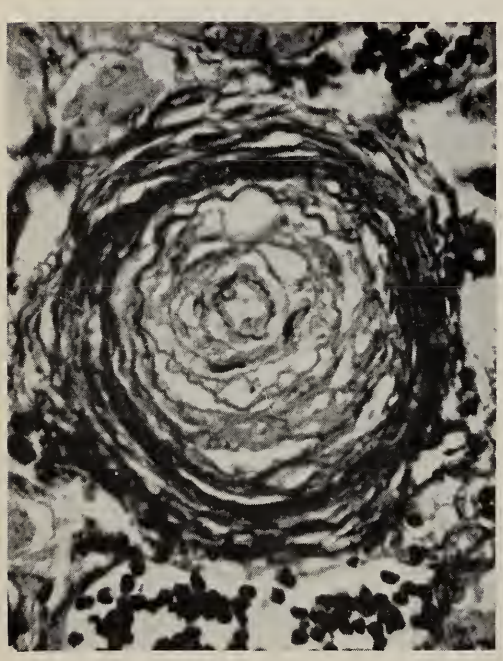


Fig. 1. Cross section of a small artery from a case of malignant hypertension. Note the very thick intima, the small lumen, and the concentric layers of elastic tissue and collagen.

TABLE III. A COMPARISON OF THE MAXIMUM SYSTOLIC BLOOD PRESSURE IN MALIGNANT HYPERTENSION AND CHRONIC GLOMERULONEPHRITIS

Maximum Systolic Blood Pressure (mm. Hg)	Number of Cases			Per Cent Due To	
	Malignant Hypertension	Chronic Glomerulon.	Total Cases	Malignant Hypertension	Chronic Glomerulon.
Below 150	20	68	88	22.7	77.3
150 to 170	20	47	67	29.8	71.2
170 to 180	18	35	53	34.0	66.0
180 to 200	62	71	133	46.6	53.4
200 to 240	253	72	325	77.8	22.2
240 to 300	246	18	264	93.2	6.8
Total	619	311	930	66.6	33.4

From the Department of Pathology, University of Minnesota.
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WHEN a patient with hypertension and renal insufficiency is admitted to the medical service, it is often difficult to determine the basic nature of his illness. If there is glyosuria or a high fasting blood sugar, a diagnosis of intercapillary glomerulosclerosis is indicated. Bilateral polycystic kidneys often may be recognized by palpation or roentgenography. Very rarely this syndrome may be produced by obstructive pyelonephritis complicating benign hypertension. When diabetes has been excluded, 99 per cent of the cases are either chronic glomerulonephritis or malignant hypertension. In this discussion malignant hypertension is defined as primary hypertension with renal insufficiency.

Clinically malignant hypertension and chronic glomerulonephritis are difficult to distinguish after the onset of renal insufficiency, since both are characterized by hypertension and uremia. But when an accurate history is available for a few years preceding the onset of uremia there is usually no difficulty in making the distinction. In malignant hypertension the high blood pressure precedes the onset of uremia while in chronic glomerulonephritis the blood pressure is not elevated until after a demonstrable renal insufficiency has developed. In about one-third of the cases of chronic glomerulonephritis a well-documented history of acute glomerulonephritis is available; but in the remaining two-thirds the acute attack is not recognized. The cardinal signs of acute glomerulonephritis are hematuria, proteinuria, edema, and hypertension. Proteinuria alone constitutes insufficient evidence of glomerulonephritis. Often the available clinical history is not sufficient for a differential diagnosis.

In this study, the diagnosis is based in every case upon the microscopic structure of the kidneys. Malignant hypertension is an occlusive disease of the renal arteries with secondary atrophy of the glomeruli and tubules. There is a fibro-elastic intimal thickening of the medium-sized and small arteries (Fig. 1). The arteries show a massive thickening of the intima with replacement of most of the muscular media. The concentric rings of elastic and collagenous fibers reduce the lumen to a small opening and produce the so-called "onion-skin" appearance. This intimal thickening affects the small arteries but not the afferent arterioles.

The terminal arterioles frequently show thrombosis of the lumen with necrosis of the wall of the arteriole. This is called thrombonecrosis. It occurs only in malignant hypertension and is usually associated with a sharp decrease of renal func-

TABLE IV. A COMPARISON OF THE WEIGHT OF THE HEART IN MALIGNANT HYPERTENSION AND CHRONIC GLOMERULONEPHRITIS

Weight of Heart (Grams)	Number of Cases			Per Cent Due To	
	Malignant Hypertension	Chronic Glomerulon.	Total Number	Malignant Hypertension	Chronic Glomerulon.
Males					
Below 300	1	11	12	8.3	91.7
300 to 400	24	43	67	35.8	64.2
400 to 500	70	77	147	47.6	52.4
500 to 600	136	54	190	71.6	28.4
600 to 700	125	25	150	83.3	16.7
700 to 800	58	1	59	98.3	1.7
800+	26	3	29	89.6	11.4
Total	440	214	654	67.3	32.7
Females					
Below 300	2	21	23	8.7	91.3
300 to 400	32	58	90	40.0	60.0
400 to 500	79	39	118	67.0	33.0
500 to 600	81	9	90	90.0	10.0
600 to 700	34	4	38	87.4	12.6
700 to 800	8	0	8	100.0	0.0
800+	1	1	2	50.0	50.0
Total	237	132	369	64.2	35.8

tion. The necrosis sometimes extends from the arteriole into the glomerulus.

When the kidney of malignant hypertension is examined under low magnification (Fig. 2) the most impressive feature is the thick-walled arteries. Because of the ischemia most of the glomeruli are hyalinized and the tubules are atrophic.

Conversely, in chronic glomerulonephritis (Fig. 3), the small arteries are inconspicuous. One sees many hyaline glomeruli and other glomeruli whose capillaries are only partly occluded. This is a primary disease of the glomeruli with secondary tubular atrophy. The arteries and arterioles are not involved.

In both malignant hypertension and chronic glomerulonephritis, many hyaline glomeruli and atrophic tubules are noted. The problem for the pathologist is determining whether the cortical atrophy is due to primary disease of the glomeruli or primary occlusion of the small arteries. The distinction can usually be made without difficulty.

This study is based upon the clinical records and necropsy material of 708 cases of malignant hypertension and 368 cases of chronic glomerulonephritis. It includes every case of each group in the necropsy records of the Department of Pathology at University of Minnesota Hospitals from 1918 through 1957. The chief purpose of the study is to establish clinical distinctions between these two diseases.

TABLE V. A COMPARISON OF THE COMBINED WEIGHT OF THE KIDNEYS IN MALIGNANT HYPERTENSION AND CHRONIC GLOMERULONEPHRITIS

Weight of Kidneys (Grams)	Number of Cases			Per Cent Due To	
	Malignant Hypertension	Chronic Glomerulon.	Total	Malignant Hypertension	Chronic Glomerulon.
50 to 100	26	45	71	36.6	63.4
100 to 150	99	74	173	57.2	42.8
150 to 200	140	61	201	69.6	30.4
200 to 300	291	95	386	75.4	24.6
300 to 400	116	48	164	70.7	29.3
400 to 500	30	31	61	49.2	50.8
500+	2	11	13	15.4	84.6
Total	704	365	1069		

Type of Onset.—It was noted above that in malignant hypertension the high blood pressure precedes the onset of renal insufficiency while in chronic glomerulonephritis the reverse relation obtains.

Age (Table I).—In persons under 30 years of age it appears that about 85 per cent of the cases are glomerulonephritis, but after that age malignant hypertension preponderates greatly. After

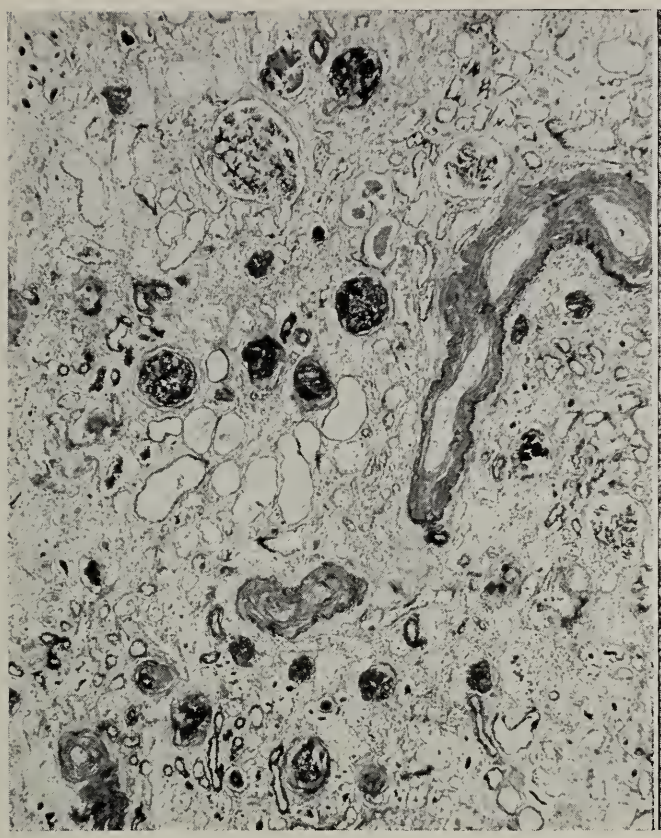


Fig. 2. Kidney from a case of malignant hypertension. Low magnification. Note thick-walled arteries, hyaline glomeruli and atrophic tubules. There are a few normal glomeruli.



Fig. 3. Kidney from a case of chronic glomerulonephritis. The arteries are inconspicuous. Many glomeruli are obliterated, but a majority are only partially occluded and are connected to tubules that are decreased in size because of the reduced glomerular filtration.

the age of forty years hypertension is four times as frequent and after sixty years—six times as frequent as glomerulonephritis.

TABLE II. DURATION OF SYMPTOMS

Duration of Symptoms	Malignant Hypertension		Chronic Glomerulonephritis	
	Number of Cases	Per Cent of Total	Number of Cases	Per Cent of Total
1 wk. to 6 mos.	113	17.1	71	21.4
6 mos. to 1 yr.	60	9.1	38	11.4
1 to 3 yrs.	168	25.4	63	19.0
3 to 5 yrs.	90	13.6	44	13.2
5 to 10 yrs.	137	20.7	63	19.0
10 to 15 yrs.	54	8.2	21	6.3
15 to 20 yrs.	24	3.6	14	4.2
20 to 30 yrs.	12	1.8	11	3.3
30 to 34 yrs.	3	0.4	7	2.1
Total	661		332	

Sex (Table I).—In the necropsies there are about twice as many males as females in subjects over twenty-five years of age, so that the number of females should be doubled in comparing sex incidence. When this adjustment is made it appears that there is no sex preponderance in glomerulonephritis; but in malignant hypertension there is a great preponderance of females in the group twenty to forty years old.

Duration of Symptoms (Table II).—The total duration of the disease can seldom be determined accurately. We know when the patient first noticed something abnormal but the disease develops insidiously and is commonly well advanced before a physician is consulted. In about one-third of the cases of chronic glomerulonephritis the onset may be dated by the acute attack; but in the remainder the first symptoms noted by the patient are those referable to renal insufficiency such as anemia, weakness, headache, and dyspnea.

In malignant hypertension the onset is usually dated by symptoms of myocardial failure, coronary disease, headache, apoplexy, or anemia. Often a high blood pressure is found on routine examination of an asymptomatic person. Commonly, hypertension is present many years before the appearance of impressive symptoms. The great majority of persons with malignant hypertension have had "benign" hypertension many years before the

malignant phase develops. Only about 20 per cent of persons with severe primary hypertension, e.g., 180/100 mm. Hg or higher, ever develop renal insufficiency. More commonly they die of myocardial failure, coronary disease, or apoplexy.

The duration of symptoms shown in Table II is, of course, not a true measure of the duration of the high blood pressure, especially in cases of short duration. The table shows only the duration of impressive symptoms. It is noteworthy that fifteen subjects were known to have had hypertension for over twenty years. Duration of symptoms is not helpful in distinguishing malignant hypertension from chronic glomerulonephritis.

Proteinuria.—The routine urine examination during the last hospital admission of 558 patients with malignant hypertension showed proteinuria: 0 or a trace in 11.5 per cent; 1+ or 2+ in 48.2 per cent; and 3+ or 4+ in 40.3 per cent. In 328 cases of chronic glomerulonephritis the urine showed protein: 0 or a trace in 4.3 per cent; 1+ or 2+ in 36.6 per cent; and 3+ or 4+ in 59.1 per cent. Proteinuria is usually more pronounced in glomerulonephritis especially in cases of subacute type; but the difference is not enough to be of diagnostic value. There may even be hematuria in acute fulminating malignant hypertension. Proteinuria in an otherwise asymptomatic individual does not establish a diagnosis of glomerulonephritis.

Edema.—In 668 cases of malignant hypertension, peripheral edema was absent at all times in 52.2 per cent, moderate in 37.1 per cent, and severe in 10.6 per cent. In this disease edema is due to right heart failure.

In 376 cases of chronic glomerulonephritis there was no edema at any time in 41.5 per cent; moderate edema in 40.2 per cent, and severe edema in 18.3 per cent. The edema in this disease is due to low plasma albumin resulting from proteinuria and malnutrition. Occasionally myocardial failure is a contributory factor. Edema has some value in the differential diagnosis if its cause can be established.

The Blood Pressure (Table III).—The cases are grouped in Table III with respect to the maximum blood pressure. The pressure may be low early in the disease or it may fall terminally as a result of cardiac failure. The systolic pressure is cited since the diastolic usually corresponds with it; but a diastolic of 100 mm. Hg or more is considered hypertensive even when the systolic pressure is below 150 mm. Hg.

There are twenty cases of malignant hypertension in which the systolic pressure was below 150 mm. Hg and the diastolic below 90 mm. Hg. All of these had the typical kidneys of malignant hypertension microscopically. In ten of these the heart was very large indicating that the low pressure was due to cardiac failure in a previously hypertensive subject. In the other ten cases the hearts were of normal size and we cannot prove that these subjects were ever hypertensive.

About 80 per cent of persons with malignant hypertension exhibit systolic pressures of 200 mm. Hg or higher, while only 30 per cent of those with glomerulonephritis have such pressures. It also appears that 77.8 per cent of patients with a systolic pressure of 200 to 239 mm. Hg, and 93.2 per cent of those with 240 mm. Hg or higher have malignant hypertension. On the other hand, about 80 per cent of patients with uremia and a systolic pressure below 180 mm. Hg are examples of glomerulonephritis—other causes of azotemia having been excluded.

It is to be remembered that in malignant hypertension the high blood pressure *precedes* the signs of renal insufficiency, while in glomerulonephritis the elevated pressure is *caused* by renal insufficiency. Commonly persons with malignant hypertension have had a high blood pressure for many years with no evidence of renal involvement other than proteinuria. In chronic glomerulonephritis the blood pressure is only moderately elevated at first but gradually rises to higher levels as renal insufficiency increases. But in malignant hypertension one often finds a gradual rise of blood pressure over several years.

Hemoglobin.—A severe anemia is found in all cases of chronic uremia regardless of etiology. In some cases of malignant hypertension with acute uremia the hemoglobin is only moderately diminished.

Significance of Vascular Disease.—Among 368 cases of chronic glomerulonephritis there were three clinical cases of coronary disease and three cases of apoplexy—an incidence of 1.6 per cent of vascular disease. Among 708 cases of malignant hypertension there were forty-seven clinical cases of coronary disease, fifty-one instances of ence-

phalomelacia, and twenty-nine cases of cerebral hemorrhage. If we subtract seven overlapping cases with both apoplexy and coronary disease we have 120 serious vascular lesions. This gives an incidence of 17.2 per cent vascular disease in malignant hypertension as compared with 1.6 per cent in chronic glomerulonephritis. If a patient with hypertension and uremia gives a history of coronary disease or apoplexy, malignant hypertension is highly probable.

Hypertensive Retinopathy.—Hypertensive retinopathy is used to include eyegrounds with hemorrhages and exudates (grade 3), as well as those with papilledema. The data on this topic are wholly inadequate since the eyegrounds were examined in only about one-half of the patients. Presumably retinopathy was less frequent in those not examined since they did not complain of poor vision. Retinopathy was noted in 92 per cent of 354 subjects with malignant hypertension, and in 75 per cent of 155 patients with glomerulonephritis. There is a direct correlation between the height of the blood pressure and the presence of retinopathy. Subjects with glomerulonephritis and a systolic blood pressure of 200 mm. Hg or higher usually have retinal changes. A few persons with malignant hypertension and very high blood pressure do not have retinal stigmata.

Weight of the Heart (Table IV).—At necropsy the weight of the heart is of some value in the differential diagnosis. In males about two-thirds of the hearts weighing less than 400 gm. are cases of glomerulonephritis; and about 80 per cent of those weighing over 500 gm. and 90 per cent of those weighing over 600 gm. are examples of malignant hypertension.

In female patients, about 70 per cent of the hearts weighing less than 400 gm. are examples of glomerulonephritis, and about 90 per cent of those weighing over 500 gm. are cases of malignant hypertension.

Weight of the Kidneys (Table V).—The combined weight of the kidneys is shown in Table V. The kidneys were severely contracted (50 to 150 gm.) in 17.6 per cent of the malignant hypertensive subjects and in about 33 per cent of those with glomerulonephritis. Some degree of shrinkage (less than 300 gm.) was present in about three-fourths of each group. A majority of the large kidneys are examples of chronic glomerulonephritis in which shrinkage had not developed. The size of the kidneys is not helpful in the differential diagnosis; but if one finds hard rigid arteries entering the kidney, a diagnosis of malignant hypertension is indicated.

Summary

Among 1,076 subjects dead of uremia associated with hypertension, there were 706 cases of malignant hypertension and 368 cases of chronic glomerulonephritis. The differentiation between these two diseases was made by histologic study of the kidneys.

When a complete clinical history is available, the differential diagnosis is not difficult, since in malignant hypertension the high blood pressure precedes the renal insufficiency while in chronic glomerulonephritis the reverse obtains.

When the clinical history is inadequate, the following points are useful in the differential diagnosis:

In about one-third of the cases of chronic glomerulonephritis a well-documented history of an acute attack establishes the diagnosis. A history of proteinuria without edema is not sufficient evidence of acute glomerulonephritis.

About 85 per cent of subjects under thirty years of age with hypertension and uremia have glomerulonephritis. After the age of forty years malignant hypertension is four times more frequent and after sixty years six times more frequent than glomerulonephritis.

In the group twenty to forty years of age, there is a great preponderance of malignant hypertension in females.

The duration of symptoms is not helpful in distinguishing malignant hypertension from chronic glomerulonephritis.

Only about 20 per cent of persons with severe benign hypertension ever develop the malignant phase.

About 80 per cent of persons with malignant hypertension exhibit pressures of 200 mm. Hg or higher, while only 30 per cent of those with chronic glomerulonephritis exhibit such pressures. Over 90 per cent of those with systolic pressures of 240 mm. Hg or higher have malignant hypertension.

Retinopathy is not a distinctive feature since it is related to the height of the blood pressure and not to its cause.

Traumatic Shock

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SHOCK is defined as a state of persistent deficiency of blood flow with inadequate perfusion of all the body tissues. Intrinsic within this statement is the realization that this state of shock causes tissue damage, which in turn increases the shock picture. This leads to the truism that shock promotes shock. There is a diminished circulating blood volume, diminished arterial blood pressure, and diminished cardiac output. Peripherally there is a marked arterial vasoconstriction. These factors produce a marked decrease in the perfusion of tissues with oxygen and nutrients and an accumulation within the tissues of various metabolites.

Pathologic Physiology

The *heart* usually beats at an increased rate, allowing a shorter time for diastolic filling of the coronary bed. Diminished perfusion pressure at the coronary ostia also contributes to decreased coronary circulation. In the presence of atheromas of the coronary vessels, this diminution of the coronary circulation becomes especially critical.

In the *lungs,* diminished perfusion produces carbon dioxide retention, with a respiratory acidosis which contributes to poor cardiac action and potentiates the shock picture. Late in the shock syndrome actual hypoxia from poor pulmonary circulation results.

In the *kidneys* a particularly early and severe arterial vasoconstriction occurs, with diminution and cessation of renal function. The early effects of this change are accumulation of nitrogenous products, and the loss of renal actions on acid-base balance. Should these conditions persist, destructive lesions of the tubules occur, with acute renal insufficiency as a result.

In the *liver* the diminished perfusion secondary to shock produces failure of the detoxifying actions with an accumulation of pigments, toxins and metabolites in the system, which products further contribute to the formation of shock.

The *blood vessels* themselves, by virtue of diminished perfusion, lose their ability to constrict, producing a loss of peripheral resistance and an increase in the shock picture. All tissues of the body subjected to inadequate perfusion are unable to perform normal metabolic functions, with a resulting hypoxic acidosis. The interruption of energy metabolism yields an elevation of pyruvic acid, lactic acid, and amino acids, and a shift of potassium out of the cells. These changes promote cardiac arrhythmias and failure, as well as shock.

Where sepsis is a part of the clinical picture, inadequate perfusion of the tissues impairs body defenses and promotes sepsis, with further aggravation of the shock picture.

An iatrogenic effect should also be noted, namely the effect of citrate. Hypovolemic shock calls for the administration of large volumes of citrated human blood. Under the situations of shock, the citrate is not oxidized as it is in the normal patient, and has two effects: ionized calcium is bound, producing hypocalcemia; and acidosis is magnified. Hypocalcemia and acidosis potentiate cardiac difficulties and promote the shock picture.

In summary, some of the metabolic effects of shock are: metabolic acidosis, respiratory acidosis, hyponatremia, hypocalcemia, hyperkalemia, and hypermagnesemia. These changes reduce the effects of epinephrine and norepinephrine on the contraction of peripheral vessels and on the rate and contraction of the heart. They reduce the effect of digitalis on the heart. They reduce the efficiency of myocardial contractions. These effects arise from inadequate tissue perfusion, and immediately reduce tissue perfusion, progressively deepening shock. The therapeutic conclusions are that shock promotes shock and that, *to be successful, reversal of the shock picture must be accomplished as rapidly as possible.*

Hypovolemia of Shock

Traumatic shock is almost always a hypovolemic shock, with the blood volume lost in one of the five following ways.

1. By arterial hemorrhage, as in bleeding ulcer, ectopic pregnancy, ruptured spleen, or vascular trauma. Arterial hemorrhage is characterized by a sudden loss of peripheral resistance with a resultant precipitous drop in arterial blood pressure.

2. By capillary and venous hemorrhage, as in fractures and soft tissue trauma. The major part of the blood loss in these conditions comes from

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the side of the circulation distal to compensatory vasoconstrictive reactions. Consequently, arterial blood pressure is better maintained and the shock picture develops more slowly.

3. By interstitial losses of blood and plasma as in hemorrhagic pancreatitis, fractures, and soft tissue trauma of extensive nature.

4. By interstitial losses of plasma as in burns, peritonitis, and wound sepsis.

5. By losses of water and salt as in diarrhea, vomiting, fistulous drainage, intestinal obstruction.

For the sake of completeness we should mention normovolemic shock which includes the following mechanisms:

1. Cardiogenic, as in coronary occlusion, cardiac tamponade, and hypervagotonic conditions.

2. Endocrinogenic: adrenal cortical insufficiency, either with true Addison's disease or with adrenal cortical suppression secondary to medication; also adrenal medullary insufficiency secondary to surgical removal of the adrenals or of a functioning pheochromocytoma.

3. Anaphylactic.

4. Septic especially with Gram-negative bacteremia.

5. Neurologic, secondary to traumatic or other lesion of the central nervous system. These latter three mechanisms apparently work by loss of peripheral resistance without primary effects on blood volume.

Faced with the patient in traumatic shock, which we have described to be usually related to loss of blood volume, we are required to restore blood volume promptly and completely. We must decide how much blood need be replaced. In pure hemorrhage, a rule of thumb may be stated that a healthy patient may lose up to 15 per cent of his blood volume without shock. Moderate shock with a systolic pressure of 70 to 90 mm. of mercury and a pulse of 110 to 130 beats per minute would indicate a loss of blood volume of about 25 per cent. Severe shock with a systolic blood pressure essentially unobtainable, and with oliguria, represents about 30 to 50 per cent loss of blood volume.

As time passes, however, replacement of this much blood volume may be insufficient to resuscitate the patient in traumatic shock. Very large amounts of blood and plasma may be sequestrated in the damaged tissue. Several hours following the traumatic episode with extensive tissue damage another 50 per cent of blood volume may be sequestrated and physiologically lost to the patient. With massive soft tissue trauma even 100 per cent of blood volume may become so sequestrated. This is the explanation for the massive requirements of blood and blood substitutes to resuscitate the patient suffering from severe traumatic shock. The requirement for adequate resuscitation may far exceed the actual blood lost as hemorrhage.

Should surgery become necessary in the early treatment of the shock patient, anesthesia may affect the circulation by promoting vasodilation, decreasing peripheral resistance and dropping the blood pressure again. Consequently, more blood volume may be necessary for the patient to withstand anesthesia. Attending surgical blood losses must also be replaced. Considering all these factors, it is obvious that very large amounts of blood may be necessary even up to three blood volumes of the patient in question.

It is Moore's[1] suggestion that these volumes of blood be given rapidly and fearlessly to the patient in shock, including old people in whom coronary disease may be present. He states that it is far preferable to accept the risk of over-transfusion rather than to accept the risk of inadequate resuscitation. Over-transfusion will be signaled by a rise in venous pressure as the heart begins to fail. In most circumstances, the heart will be able to absorb the blood from the venous side and pump it out on the arterial side to restore adequate blood pressure. However with diminished coronary perfusion pressure, particularly in the presence of coronary sclerosis, the heart may be too severely handicapped in the shock state to pump blood from the venous side sufficiently well to restore arterial blood pressure. Should cardiac failure, with elevation of venous pressure, occur before the restoration of arterial blood pressure, then digitalization and intraarterial transfusion are indicated. The function of intraarterial transfusion is to elevate the arterial blood pressure for several minutes, and allow the blood coming from the left ventricle to perfuse the coronary tree at an elevated arterial pressure, in the hope that myocardial function will be sufficiently improved to allow the heart to maintain adequate circulation from this point on.

We may estimate our resuscitative requirements then as units of blood volume for the patient at hand. This figure must be translated into cubic centimeters, and our conversion factor is calculated as follows. For women, 6.5 per cent of

actual body weight is a good approximation of the blood volume. In the case of men, 7 per cent of body weight applies. Obesity shifts the figure to the lower side, and heavy musculature makes this percentage somewhat higher. Plasma volume is estimated at 4 per cent of actual body weight.

Plan of Therapy

We are now ready to outline a plan of initial treatment of the traumatized patient in severe shock. The most urgent initial steps are to establish a free airway, to control hemorrhage, and to evaluate central nervous system injury. The next step is to start intravenous fluids, which almost certainly will be required unless the patient has either brain damage or crushing injury to the chest which may promote a wet lung. With these steps underway and while blood is being made available, complete examination must be performed. The purpose of this examination is threefold: to identify all injuries which have occurred, to establish a base line of physical findings for future examination as further evidences of injury may develop, and to identify any pre-existing diseases which may affect the patient's physiology. An indwelling urethral catheter should be inserted for the purposes of identifying possible injury to the urinary tract and of enabling the physician to measure the hourly urine output, a vital measurement in the consideration of the patient in traumatic shock. And finally, the circulating blood volume must be restored. This must be accomplished rapidly and completely, through two or three intravenous portals as necessary, so that the calculated requirement can be infused within sixty to ninety minutes. One gram of calcium gluconate should be administered with each 1000 cc. of bank blood.

There are certain danger signals which must be observed in the shock patient. If the *skin is warm and dry* in the presence of shock, beware of central nervous system injury. *Cyanosis* is not usually present in pure shock. One should beware of airway obstruction, pneumothorax, mediastinal emphysema, flail chest, cardiac tamponade, or ruptured viscus. While the patient's mental state may be depressed, true *coma* should suggest the presence of injury to the central nervous system. A *bradycardia* instead of tachycardia should suggest hypervagotonia, as seen recently in a patient with multiple fractured ribs under observation for possible ruptured spleen. Twelve hours after the injury her blood pressure dropped precipitously and she appeared to be in shock. Surgery for splenectomy seemed indicated, but it was noted that her pulse was only 60. Intravenous atropine relieved all abnormal findings and the patient never required surgery at all. Another danger signal is an *elevated venous pressure*. In ordinary shock, the peripheral veins are collapsed and empty. If the pressure is elevated one should suspect either cardiac failure or cardiac tamponade. Venous pressure can be readily measured by means of a side arm from the transfusion apparatus. *Hyperpyrexia* in the patient in traumatic shock should suggest sepsis or adrenal cortical insufficiency. A general alarm for complete re-evaluation of the patient should be sounded by the *failure of the patient to respond* to adequate transfusion.

Urgent and complete re-evaluation should be accomplished along the following lines. Has the transfusion requirement been accurately estimated or is it in fact inadequate? Is the patient suffering from continuing hemorrhage as from a ruptured spleen or liver? Does the patient have some respiratory inefficiency which can be corrected? Pneumothorax, mediastinal emphysema, or parodoxical motion of the thoracic cage should be again sought for. Is a cardiac lesion contributing to the circulatory inadequacy? The patient may have a myocardial infarction secondary to diminished coronary blood flow, or he may develop cardiac failure, or he may develop a cardiac tamponade. Does the patient have suppressed adrenal function because of previous steroid medication? Does he have an electrolyte imbalance secondary to diarrhea, vomiting, or to low-salt diet for cardiovascular disease? Is there sepsis?

Sepsis may take several forms. It may supervene in the wound which caused the shock, and aggravate fluid losses and toxicity. It may cause the shock by sequestrating large amounts of blood volume in an infected area. This might be particularly true in clostridial infections, and become clinically important as early as six hours after trauma. Or sepsis can produce a direct hypotension with bacteremia by means of diminishing cardiac output and diminishing peripheral resistance.

Good treatment of the patient in traumatic shock requires continual, maximal, careful, enlightened attention by the physician, for whatever time is required to return the patient to well-compensated, stable circulation. Anything less may cost success.

Reference

1. Moore, Francis D.: Metabolic Care of the Surgical Patient. Philadelphia: W. B. Saunders Co., 1959.

Metabolism of Fructose In Man

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KULZ,[1] in 1874, first reported that diabetic patients were able to utilize fructose given orally better than other sugars. Joslin[2] in 1946 stated that in his experiments "at first the fructose was well utilized, but later hyperglycemia and glycosuria usually followed." He found that a diet containing Jerusalem artichokes yielding fructose on digestion could be taken for a period of at least three years without the subject losing his ability to utilize it more efficiently as compared with an equal amount of starch. Minkowski[3] in 1893 observed that fructose in contrast to glucose led to the formation of glycogen in the liver when given to depancreatized dogs. In 1926, Cori[4] demonstrated that the first step in the metabolism of glucose is its phosphorylation to glucose-6-phosphate catalyzed by the enzyme glucokinase only in the presence of insulin. Conversely, he showed that fructose plus A.T.P. (fructokinase) fructose-6-phosphate plus A.D.P. reaction proceeds whether or not insulin is present. Hepatic glycogen is formed much more rapidly from fructose than from glucose, but when stress glycogen formed from fructose is broken down in the liver, it emerges as glucose, not fructose, and insulin is then required to re-incorporate it into the metabolic cycle, as shown in Cori's work. In 1929, Cori[5] studied the utilization of muscle in known amounts of intravenously injected fructose and glucose in eviscerated, depancreatized rats, and subsequently analyzed the entire carcasses for free sugar, finding 39 per cent of the fructose and only 10 per cent of the glucose had disappeared in one hour. The injection of insulin resulted in a marked increase in the rate of disappearance of glucose but had no effect on the metabolism of fructose. In 1950, Slein and Cori[6] showed that separate enzymes existed in muscle for the phosphorylation of fructose and glucose. Insulin apparently acts only with glycokinase. In the liver also a separate enzyme has been identified for the phosphorylation of fructose. In 1951, Chernick and Chaikoff,[7] using a C-14 labeled fructose, found no significant difference in the capacities of normal and diabetic rat livers to oxidize fructose to CO_2.

In 1950, Weichelbaum, Elman, and Lund[8] compared the rates of utilization of intravenously administered 10 per cent glucose and 10 per cent fructose. They found a marked increased speed of assimilation of fructose over glucose as manifested by low blood sugar levels, decreased glycosuria, and decreased water diuresis. They concluded that fructose is a better utilized sugar than glucose for intravenous feeding. In 1951, Craig, Drucker, Miller, Woodward, and co-workers[9] carried on an intensive and systematic study of the metabolism of intravenously administered fructose. Since oral administration of fructose could

not be expected to demonstrate quantitatively, the full effects of fructose because of conversion of at least a portion to glucose by both intestinal mucosa and liver, they gave alternate infusions of glucose and fructose to both normal and diabetic subjects at a rate of 1 gm. of fructose per kilogram, intravenously in a 10 per cent solution, constantly over a period of sixty minutes. The results obtained were compared in the same individual similarly with glucose. The diabetic subjects had had insulin withheld for at least fourteen hours prior to all tests. The fructose and glucose levels were determined separately in both blood and urine, and changes in blood pyruvic acid and serum inorganic phosphorus levels were determined in certain cases as additional indices of carbohydrate metabolism.

Metabolism in Normal Individuals

In normal individuals, this infusion of glucose produced an average blood sugar peak of 253 mg. per cent; the mean excretion of glucose was 6.1 gm. and the average urine volume for three hours after the start of the infusion was 1130 ml. With fructose, however, the average maximum blood glucose was 98 mg. per cent; the average excretion of blood sugar was 4.4 gm. (4.3 gm. fructose and 0.1 gm. glucose), and the average urine volume was 775 ml. There was no renal threshhold for fructose. A slight rise in blood glucose following fructose administration was noted in some instances. That any fructose is excreted is explained by the fact that fructose continues to be excreted even at blood levels as low as 4 mg. per 100 ml. but the smaller rise in blood level minimizes the amount lost in the urine.

This study also showed pyruvic acid levels in the blood rose after glucose infusions, on the average of 28 per cent or 0.30 mg. per 100 ml. above the control level, the peak occurring at sixty minutes. This rise, although small in absolute terms, is significant—the associated probability being of the order of less than 0.5 per cent that so great a difference should arise in random sampling. In contrast, the pyruvate rise after fructose was strikingly higher, averaging 110 per cent or 1.22 mg. per 100 ml. above the level to start. Serum inorganic phosphorus fell after either fructose or glucose, but the difference was in the magnitude in rate of change. After fructose, the phosphorus fall was more rapid than after glucose, reaching its lowest point at thirty minutes and then leveling off at a slightly higher value after ninety minutes.

These results in the normal subject suggest the following conclusions: (1) Fructose is removed from the blood stream more than twice as rapidly as glucose during the period of infusion. (2) The rise in blood glucose following fructose administration indicates that a fraction of the fructose must have been converted to glucose. (3) The rise in pyruvate can be interpreted as an indication that both glucose and fructose are metabolized by the way of the Embden-Meyerhof series of reactions. The much greater rise after fructose is probably a reflection of its entrance into the metabolic scheme closer to pyruvic acid. Hers[10] has shown that in rats fructose is transformed into liver and muscle glycogen by splitting to the triose state and entering the glycolitic scheme just below fructose-1-6-diphosphate. The *in vivo* studies in man are consistent with this hypothesis. If the fall in serum inorganic phosphorus reflects the process of phosphorylation in the metabolism of carbohydrate, the more rapid decrease in phosphate after fructose administration is an indication of the more rapid metabolism or utilization of this sugar.

Metabolism in Diabetic Subjects

Miller and his associates[9] showed that when glucose was infused at the same rate in diabetics from whom insulin had been withdrawn temporarily, the average maximum blood glucose level was 543 mg. per cent, the average glucose excretion was 26.9 gm., and the average urine volume was 731 ml. When fructose was given to the same patients, the mean peak blood glucose level was 337 mg. per cent and the average maximum fructose level was 76 mg. per cent. Although the average total of sugar excretion was only 16.6 gm. (3.7 gm. fructose and 12.9 gm. glucose) the average diuresis was 837 ml. This failure in urine volume to parallel the decrease in total sugar excretion was unexplained. It was noted that in diabetics, fructose disappeared from the blood stream at the same rate as in non-diabetics, since the blood levels of fructose and the amount of fructose excretion were essentially the same in both groups. Most of the total sugar excretion in these diabetics from whom insulin was withheld, was glucose. The metabolism of fructose in the diabetic is similar to that observed in the normal person, but it did differ in that there was a more marked rise in blood glucose following fructose, and this rise was roughly proportionate to the severity of the diabetes.

Approximately 20 per cent of the total amount infused was retained or utilized when fructose was administered. It was interesting to note the disadvantages were independent of the severity of the diabetes.

Another striking difference in the metabolism of glucose and fructose in the diabetic subject was shown by changes in the blood pyruvic acid. After glucose, a significant rise in pyruvate did not occur until ninety minutes, and this rise was sustained even at 180 minutes. In eighteen normal subjects, the maximum rise occurred at sixty minutes or earlier in ten instances, compared with a similar early rise in only one out of the twenty-four experiments in diabetic subjects. Furthermore, in seven of these diabetic patients, no rise was found. In contrast, rise in pyruvate after fructose administration in the diabetic state occurred just as promptly as in the normal subject. The magnitude of this increase was at least as great as in the non-diabetic and was significantly higher from ninety to 180 minutes.

In diabetic subjects, the response of serum inorganic phosphorus through the administration of intravenous glucose and fructose was also markedly different.

After glucose, only a slight fall (statistically not significant) occurred in the first ninety minutes. After fructose there was the same rapid fall, somewhat less in magnitude compared to the normal, in the first thirty minutes with a rise after ninety minutes.

The results in the diabetic subjects in the absence of insulin effect indicate that there is very little impairment in the metabolism of fructose as shown by: (1) essentially similar rate of removal from the blood stream as in the normal person; (2) no reduction in the height of pyruvate rise; and (3) rapid fall in serum inorganic phosphate. In contrast, in parallel circumstances, glucose disappearance from the blood was markedly delayed. The rise in pyruvate is either abolished or delayed in appearance and the phosphate fall is not significant.

Miller et al[9] compared the effects of fructose given by mouth when compared in three individuals with the same amount given intravenously. The fructose was ingested as a 10 per cent solution in water within a few minutes at the beginning of the experiment, while the same amount was given intravenously as a 10 per cent solution in sixty minutes on another occasion. In each instance, after oral administration, the blood fructose level was much lower than that found after intravenous injection, while the elevation of blood glucose was more than twice as great and remained higher for a longer period of time. Part of the fructose, therefore, must have been converted to glucose in its passage through the intestinal mucosa and the liver. In order to compare or determine more directly the amount of conversion of fructose to glucose by the intestinal mucosa, a patient with cirrhosis of the liver and portal obstruction with large superficial and abdominal anastomotic veins was given 50 gm. of fructose by mouth. Femoral artery blood and portal anastomotic vein blood samples were collected simultaneously in thirty and sixty minutes and analyzed for fructose and glucose. If the assumption is made that the utilization of hexose by the intestinal wall is negligble, then the ratio of the increase in the portal anastomotic vein blood glucose to total hexose will be the approximate measure of the conversion of fructose to glucose during the passage through the wall. In the first sample obtained in thirty minutes, the concentration of glucose in the border line anastomotic vein blood was 5 mg. per 100 ml. higher than in the arterial blood reaching the intestine. Since this could have only been derived by conversion from fructose (no other food being given) and the total hexose absorbed in the intestine was 28 mg. per 100 ml., the fraction of fructose converted to glucose during the transfer through the wall was 18 per cent. The results obtained in the second sample were in agreement, so one can say about one-sixth of the fructose in this experiment was converted to glucose during absorption. Consequently, there is less advantage in giving fructose by mouth than by the intravenous route.

The Role of the Liver

The liver plays an important role in carbohydrate metabolism and this is particularly true for fructose. To obtain more direct information in man, hepatic vein catherterizations were performed in diabetic and non-diabetic subjects by Craig and co-workers,[11] splanchnic blood flow being determined by the bromsulfalein technique. Samples of femoral artery and hepatic vein blood were drawn at frequent intervals, and estimates of splanchnic balances of glucose, fructose, and pyruvic acid were calculated by multiplying the approximate arterial-hepatic venous blood concentration difference by the corresponding estimated

splanchnic blood flow. After control samples were collected, 10 per cent fructose or glucose was infused into a peripheral vein at such a rate that one gram of sugar per kilogram of body weight was given in one hour. *Fructose was taken up by the splanchnic system twice as rapidly as was glucose in the non-diabetic subject. This ratio was maintained in the diabetic state in the absence of exogenous insulin effect.* Even in severe diabetic ketosis, the ability of the liver (splanchnic system) to take up fructose remains unimpaired. This more rapid uptake of fructose by the liver is an important factor in the more rapid disappearance of fructose from the blood stream described in the previous section. Studies of pyruvic acid, splanchnic balance in these cases, showed that the normally slow uptake of pyruvic acid was reversed when either glucose or fructose was infused. However, the output was equivalent to only 0.5 per cent of the hexose uptake when glucose was given and to 3.6 per cent when fructose was administered. Consequently, at least part of the greater peripheral concentration of pyruvic acid that occurs when fructose is given is the result of this output by the liver.

Muscle Uptake

The utilization of fructose by muscle tissue has been studied almost entirely in species other than man. Van Itallie[12] in 1953 measured fructose uptake in the forearm (composed of 80 per cent muscle) of ten non-diabetic subjects. After injection of a priming dose of between 25 and 30 gm. of fructose administered intravenously as a 10 per cent solution in approximately a thirty-minute period, the infusion was continued at a constant rate of 0.58 gm. per minute. Capillary and venous bloods were taken at fifteen-minute intervals for one hour beginning thirty to 100 minutes from the start of the experiment and the arterial-venous difference of fructose was determined. At the average arterial level between 66.1 and 68.9 mg. per 100 ml., the A-V difference ranged between 10.6 and 13.4 mg. per 100 ml., even up to two and one-half hours from the beginning of the infusion. Using the same approach, modified so that 30 gm. of fructose was given the first thirty minutes and then continued at 0.58 gm. per minute for two and one-half hours, Miller et al[13] showed a similar uptake of fructose in three experiments on stable diabetic subjects. They showed that at the end of 150 minutes, the A-V difference was more than 7 mg. per 100 ml. In an experiment on another diabetic patient, the arterial level for fructose under these conditions at the end of seventy-five minutes was 30 mg. per 100 ml. and higher than in the vein. Another priming dose was then given, and the rate of infusion was doubled to 1.2 gm. per minute. At the higher arterial levels obtained (225-250 mg. per 100 ml.) the A-V difference immediately increased and at the end of the two and one-half hours was 70 mg. per 100 ml. The magnitude of the amount taken up after such a long period of infusions suggests the conclusion that direct assimilation utilization by muscle cells must have been taking place.

Oxidation in Isotope Studies

Fructose metabolism in man is complicated by the fact that knowledge of its utilization by various tissues is still not sufficiently detailed. Miller et al[14] studied oxidation *in vivo* of C-14 fructose. Ninety microcurie of evenly labeled C-14 fructose without carrier were injected intravenously into normal and diabetic subjects and the specific activity of CO_2 in the expired air was measured at frequent intervals for a period of at least eight hours. These results were then compared with the specific activity of CO_2 in the expired air following the intravenous injection of the same amount of uniformly labeled glucose C-14 in the same normal or diabetic subjects on another occasion. After fructose in the diabetic subject, its peak activity was obtained very rapidly in not more than ten to fifteen minutes and in this instance was even faster than that achieved in the normal subject. In contrast, the peak activity of CO_2 after glucose in the diabetic subject was significantly delayed as compared with the non-diabetic subject. It appears, therefore, that there is a rapid metabolic transport of fructose to the CO_2 pool and that there is no significant reduction in this rate in diabetes even in the absence of insulin. The oxidation of fructose to carbon dioxide does not seem to be under the control of insulin.

Comparison of Glucose and Fructose in Clinical States of Stress

In comparing fructose and glucose in various clinical states associated with disturbances in carbohydrate metabolism (because of the well-documented efforts of stress situations on glucose

metabolism) a series of experiments was performed on non-diabetic human subjects in order to compare the manner in which fructose was handled in the same circumstances by Drucker and his associates.[15] Five patients scheduled for elective herniorrhaphies, under spinal anesthesia and six patients scheduled for *major surgery* (gastrectomy, etc.) under general anesthesia, were given intravenous glucose and fructose (1.0 gm. per kilogram in one hour as a 10 per cent solution) on successive days preoperatively and these were repeated on the first and second postoperative day. All four tolerance tests were done in each patient, the order in which glucose and fructose was given was alternated from case to case. The results of these tolerance tests showed that even the relatively simple trauma of a herniorrhaphy operation was sufficient to elevate the peak value of glucose at the end of the infusion and result in a delayed fall. In the major surgical cases, the lag in the fall of glucose was even more evident (58 mg. per 100 ml. above control values at 180 minutes compared to 34 mg. per 100 ml. in the herniorrhaphy operations). *The fructose tolerance tests, in contrast, were essentially unaltered by the procedure.* A patient with *typhoid fever,* studied during the height of the febrile phase, showed an alteration in glucose tolerance as compared with the test after recovery, while again the fructose tolerance curves were both normal and identical. The mechanisms by which stress situations alter metabolism of glucose are still being vigorously debated. It is possible to speculate with Price[16] that if stress results in the stimulation of the pituitary-adrenal axis (Selye) and the hormones released, inhibit the action of glucokinase resulting in a delay in the entrance of glucose into the metabolic pool, the normal disappearance curves of fructose could then be explained by the fact that fructose has its own separate fructokinase not influenced by these hormones. On the other hand, if insulin acts upon a cellular membrane system to accelerate transport of glucose[17-19] but has no effect on the entrance of fructose into the cell, it must be assumed that the stress must have some inhibitory effect on the factor or factors responsible for glucose transport, but does not affect the permeability of the cell wall to fructose.

General anesthetics, particularly ether, have been reported to elevate the blood sugar and diminish the utilization of carbohydrate.[20] Twelve volunteer subjects were given ether anesthesia without surgery for a period of ninety minutes.[21] Anesthesia was introduced by an intravenous administration of 150 to 300 mg. of thiol pental sodium in order to minimize the excitement and physical activity frequently encountered during the induction, of ether narcosis. Thirty minutes after surgical anesthesia was achieved, a specimen of blood was drawn and 1 mg. per kg. of a 10 per cent solution of glucose (six subjects) or fructose (six subjects) was infused intravenously at a constant rate for one hour, at the end of which time both the infusion and the ether were discontinued. The similar tolerance tests were done as controls in each subject one or more days preceding the anesthesia and twenty-four hours afterwards (three and four subjects in each group respectively). The effect on blood glucose and fructose levels of the first thirty minutes of anesthesia alone was studied in four subjects in each group. The results of those tests showed that ether anesthesia increased the fasting blood glucose significantly from 91 to 130 mg. per 100 ml. but did not alter the fasting blood fructose level. The glucose tolerance test also showed definite impairment during anesthesia but this effect was gone by the next day. There was a slight delay in the return of the blood fructose as compared with the control curve, but this was only a fraction of that seen with glucose (7.5 mg. per 100 ml. compared with 55 mg. per 100 ml. above control values at 180 minutes respectively.)

Starvation diabetes or the induction of impaired carbohydrate tolerance by the restriction of dietary carbohydrate, was first described in 1874 when Lehmann[22] found that the injection of sugar into the mesenteric veins produced greater glycosuria in fasted than in fed dogs. The same alteration in glucose tolerance after deprivation or reduction in carbohydrate intake has been repeatedly shown in man. Peters[23] in his comprehensive review of this problem in 1945, concluded that the available evidence at the time pointed to "defective combustion" as the cause of this impairment. The study of fructose metabolism in states of carbohydrate deprivation was undertaken in man by Miller et al,[9] to determine where the possible sites of the block in combustion might exist. Intravenous glucose tolerance tests were performed on four normal subjects that had previously been on adequate diets. After two days of fasting during which the diets consisted of meat and butter, only the

tolerance tests were repeated. Under similar circumstances, another time fructose tolerance tests were performed on the same four subjects. The rate of removal of the administered fructose was not found to be significantly altered. However, the blood glucose rise associated with the fructose administration is greater after carbohydrate restriction than in the well-fed state, and the return of the blood glucose to initial level was delayed after dietary restriction. These results afford further evidence that the metabolism of fructose differs from the metabolism of glucose in man, and indicate that the block in glucose utilization following carbohydrate deprivation involves one or more of the reactions between glucose and the entry of fructose in the glycolytic scheme. The findings are consistent with the hypothesis of Wyshak and Chaikoff[24] that the glucokinase is impaired by fasting, and the phosphorylation of fructose, which is under the influence of a separate enzyme (fructokinase) is not altered during starvation.

The importance of these observations in the management of clinical diabetes seems clear. The alterations in carbohydrate tolerance in diabetes produced by trauma, infection, or starvation are much more marked than in normal subjects. Since under these circumstances, parenteral fluids are often necessary, the evidence accumulated so far indicates the value of fructose as the carbohydrate of choice in management.

Diabetic Acidosis

Weichelbaum and Daughaday[25] were the first to report on fructose in the treatment of diabetic acidosis. Darragh, Womersley, and Meroney[26] used 2.5 per cent fructose in half normal saline as a primary replacement solution in six diabetic, ketotic patients. Insulin was used in the usual manner. In all six patients, a rapid reduction of blood ketone levels was observed. They also noted a faster decline in the total blood sugar levels in these patients than in those who had received 2.5 per cent glucose in the early hours of treatment.

Dolger and associates[27] demonstrated that fructose offers a unique advantage in the treatment of diabetic acidosis in that it decreases ketone production without aggravating hyperglycemia or glycosuria. They found that in mild ketosis, the administration of 100 gm. of fructose intravenously over a four-hour period was sufficient to abolish ketonuria, even without the use of insulin. At the same time, the hyperglycemia was not appreciably increased and glycosuria actually decreased. Thus, the use of fructose in the initial treatment of diabetic acidosis did not lead to aggravation of hyperglycemia or increased glycosuria, nor to further dehydration or to insulin resistance.

There is considerable evidence to indicate that the patient in acidosis is under stress, either spontaneously or as a result of trauma or infection that may have precipitated the acidosis.[28] A state of insulin resistance exists and insulin accordingly is less effective early in treatment. Field and Stetten[29] have demonstrated the presence of an insulin antagonist in diabetic acidosis, disappearing within hours after treatment is instituted. This antagonist was non-dialyzable and migrated electrophoretically with the alpha-globulin fraction of the serum proteins. Peters[23] has emphasized that the diabetic acidosis is almost invariably associated with carbohydrate starvation and has summarized the evidence for using glucose even in the initial stage. Later, however, Seldin and Tarail[30] reported on seventeen cases of diabetic acidosis receiving moderate or massive injections of glucose early in treatment. They found that hyperglycemia resulted in an increase in the infective osmotic pressure of the extracellular fluid, producing cellular dehydration. The administration of glucose, even though it might replenish glycogen stores and facilitate the combustion of carbohydrate, enhanced the cellular dehydration and perpetuated the polyuria because of the increased excretion of glucose in the urine.

Other authors[31-32] have strongly opposed the use of carbohydrate. Since fructose does not require insulin for its metabolism, it is more rapidly removed from the blood stream, is a better glycogen former than glucose,[33] and its metabolism is not affected by stress states or starvation, its value was assessed in the early treatment of diabetic acidosis under controlled conditions.[34] Miller[9] produced experimental acidosis with the withdrawal of insulin in a human volunteer on three separate occasions. Complete balance studies were done during withdrawal treatment and recovery periods. During insulin withdrawal periods, all exogenous and carbohydrate derived from protein and fat catabolism were excreted almost quantitatively. The period of study covered the first six hours of treatment. The amounts of insulin, water and sodium chloride were similar in each experiment, with hexose as a variable to be investigated. One hundred units of insulin were given initially and 50

units each hour thereafter, for a total of 350 units in a six-hour period in three experiments: (1) 175 gm. of fructose was given, (2) glucose was given in similar amounts and at the same rate, (3) saline alone was given. Solutions were combined in such a way that the total water administered was given at the same rate and amount in each test. When no exogenous carbohydrate was given, the blood glucose fell at an approximate constant rate. After 75 gm. of glucose, there was an initial rise in one hour of approximately 125 gm. per 100 ml. and then a steady fall when the amount of glucose infused was reduced to 20 gm. per hour. After 75 gm. of fructose there was a slight fall in blood glucose at the end of the first hour and then a rapid fall at approximately the same rate as after saline alone. Blood fructose levels were found to be at the same rate as to be expected in normal subjects, the highest level being less than 75 mg. per 100 ml. Carbohydrate balances for the first six hours were as follows: In experiment (1) the administration of 175 gm. of fructose resulted in a net balance of 163 gm.; with glucose administration the net balance was 124 gm.; and with saline alone, the total carbohydrate either stored or utilized measured only 18 gm. The excretion of fructose as such in the urine in experiment (1) amounted to less than 7 gm. Plasma inorganic phosphorus fell least after saline and most after fructose. The administration of carbohydrate did not result in any increased excretion of either sodium or potassium in the urine during treatment. Since potassium was not included in the treatment schedule in the first six hours, serum potassium levels fell, the fall being approximately the same in each instance. After fructose administration there was evidence of some transference of potassium into the cells which was lacking in the other two experiments. *Urinary volume was definitely greater with glucose therapy, but fructose, because of a much smaller excretion of hexose in the urine, caused only slightly greater water output as compared with the control regimen.* Serum ketone levels fell on the average about 25 per cent faster when carbohydrate was administered. No significant difference was found between fructose and glucose in this respect.

Some writers have suggested the recovery from the acidosis would be delayed with fructose therapy because of the markedly increased rate of formation of pyruvic and lactic acid in the blood. Data pertinent to the discussion were obtained in these three experiments on the fourth occasion, when fructose again was used in the treatment under similar controlled conditions. The results show that the use of fructose actually increased the rate of recovery from acidosis, a conclusion that might have been anticipated from the known facts of fructose metabolism. There is no delay in recovery from the acidosis, despite the increased production of pyruvic and lactic acids.

The fundamental goal in the treatment of diabetic acidosis is rapid restoration of normal carbohydrate metabolism. It is imperative to re-establish direct peripheral oxidation of glucose and glycogen storage in the liver as rapidly as possible. The degree to which this can be accomplished will determine the speed from which blood and urinary ketones disappear. It has been shown that this can be affected more rapidly by using glucose from the outset than by using saline alone.[35-38]

However, the improper use of this sugar has certain intrinsic dangers, because glucose, which requires insulin for its utilization, is being given to an insulin deficient patient. This can result in prolonged hyperglycemia, glycosuria, and water diuresis. A sugar which is metabolized normally in the absence of insulin would theoretically be the best carbohydrate to use in the management of diabetic ketosis.

Fructose does not require insulin, either for direct oxidation or for its conversion to glycogen. Independent studies by many investigators confirmed this fact that fructose metabolism precedes at essentially the same rate in normal subjects, in controlled diabetics, and in diabetic acidosis.[37,38] These attributes make fructose superior to glucose in the early treatment of diabetic acidosis, because they result in greater retention and faster utilization of the administered carbohydrate. The rapid utilization of fructose confers upon it several positive advantages over the use of glucose: (1) maximal blood sugar levels are lower, (2) hyperglycemia subsides more rapidly, (3) less total glycosuria occurs, and (4) there ensues more rapid control of polyuria and thus less dehydration of the patient.

In addition, administration of fructose is superior to glucose or the use of saline alone in the management of ketosis since it results in a significantly faster fall in blood ketone levels. Fructose is therefore uniquely fitted for use in initial hours of treatment of diabetic acidosis, since it possesses all the advantages of glucose and none of its dis-

advantages. The advent of fructose renders the old saline *versus* glucose controversy obsolete: according to Seltzer and Conn,[35] higher concentrations of fructose can be used without the danger attending the use of higher concentrations of glucose.

Summary

The metabolism of fructose in normal and diabetic subjects has been reviewed:

1. The blood fructose tolerance tests have been shown to be unaltered in diabetic subjects even in the absence of exogenous insulin.

2. Fructose produces a much greater rise in blood pyruvic acid as compared with glucose and this rise is the same or greater in diabetes.

3. In hepatic vein catheterization studies, the livers of both normal and diabetic subjects remove intravenously administered fructose twice as rapidly as they do glucose in comparable situations.

4. A considerable portion of administered fructose is converted in the body but the net advantage of fructose over glucose in diabetic subjects is between 20 and 25 per cent.

5. Oral administration is less advantageous, probably because of further conversion of fructose to glucose by the intestinal mucosa during absorption.

6. It has been shown that stress situations (for example, trauma, infection, ether-anesthesia, and starvation states) do not depress fructose metabolism as they do glucose.

7. Studies in diabetic acidosis indicate the value of fructose in the initial hours of therapy.

8. The use of intravenous fructose in place of glucose seems indicated also in diabetic patients who have just undergone surgery, who have febrile illnesses, or who otherwise may be expected to manifest the insulin resistance accompanying the alarm reaction. In such situations, the use of 5 per cent or 10 per cent solutions of fructose results in less hyperglycerine, hyperglycemia, and glycosuria. This provides for greater retention of carbohydrate and of total available calories than when glucose is used. Moreover, more efficient utilization of this carbohydrate serves as a prophylaxis against the development of ketosis.

9. There is an additional advantage which becomes apparent from these studies: The surgical patient who postoperatively would have greater utilization of available calories in the sugar given, if fructose were used; and the fluid balance would be more easily regulated because of the comparatively minimal diuretic effect when compared to glucose. The direct tissue utilization, especially in patients with minimal liver reserve, would also suggest an advantage in the use of fructose in the surgical patient.

References

1. Kulz, E.: Beitrage zur Pathologie und Therapie des Diabetes Mellitus. P. 130. Marburg, 1874.

2. Joslin, E. P., Root, H. F., White, P., and Marble, A.: The Treatment of Diabetes Mellitus. 8th Ed., p. 356. Philadelphia: Lea & Febiger, 1946.

3. Minkowski, O.: Untersuchungen uber den Diabetes Mellitus nach Extirpation des Pankreas. Arch. exp. Path. Pharmak, 31:85-189, 1893.

4. Cori, C. F.: The fate of the sugar in the animal body. III. The rate of glycogen formation in the liver of normal and insulinized rats during the absorption of glucose, fructose, and galactose. J. Biol. Chem., 70:577, 1926.

5. Cori, C. F., and Cori, G. T.: Fate of glucose and other sugars in the eviscerated animal. Proc. Soc. Exp. Biol. & Med., 26:432, 1929.

6. Slein, M. W., Cori, G. T., and Cori, C. F.: A comparative study of hexokinase from yeast and animal tissues. J. Biol. Chem., 186:763, 1950.

7. Chernick, S. S., and Chaikoff, I. L.: Two blocks in carbohydrate utilization in the liver of the diabetic rat. J. Biol. Chem., 188:389, 1951.

8. Weichelbaum, T. E., Elman, R., and Lund, R. H.: Comparative utilization of fructose and glucose given intravenously. Proc. Soc. of Exp. Biol. & Med., 75: 816, 1950.

9. Miller, Max, Craig, J. W., Drucker, W. R., and Woodward, H., Jr.: The metabolism of fructose in man, Essays in Metabolism. Yale J. Biol. & Med., 29:335 (Dec.) 1956.

10. Hers, H. G.: The conversion of fructose 1-C_{14} and sorbitol 1-C_{14} to liver and muscle glycogen in the rat. J. Biol. Chem., 214:373, 1955.

11. Craig, J. W., Drucker, W. R., Miller, Max, Owens, H. E., Woodward, H., Jr.: Brofman, B., and Pritchard, W. H.: Metabolism of fructose by the liver of

diabetic and non-diabetic subjects. Proc. Soc. Exp. Biol. & Med., 78:698, 1951.

12. Van Itallie, B., Morgan, M. C., Cathcart, R. T., Gilles, G. L., and Dotti, L. B.: Peripheral assimilation of fructose in man. Proc. Soc. Exp. Biol., & Med., 84:713, 1953.

13. Miller, Max, Drucker, W. R., Owens, J. E., Craig, J. W., and Woodward, H., Jr.: Metabolism of intravenous fructose and glucose in normal and diabetic subjects. J. Clin. Invest., 31:115, 1952.

14. Miller, Max, Murphy, J. R., Craig, J. W., and Woodward, H., Jr.: Studies in experimental diabetic acidosis: Comparison of effects of fructose and glucose in initial hours of treatment. J. Clin. Endocrinol., 13:866, 1953.

15. Drucker, W. R., Miller, Max, Craig, J. W., Jeffries, W. McK., Levey, Stanley, and Abbott, W. E.: A comparison of the effect of operation on glucose and fructose metabolism. Pp. 548-555. In Surgical Forum. Philadelphia: W. B. Saunders Company, 1953.

16. Price, W. H., Cori, C. F., and Colwick, S. P.: The effect of anterior pituitary extract and of insulin on the hexokinase reaction. J. Biol. Chem., 160:633, 1945.

17. Levine, R., and Goldstein, M. S.: On the mechanism of action of insulin. Recent Prog. Hormone Res., 11:343, 1955.

18. Park, C. R., Bornstein, J., and Post, R. L.: Effect of insulin on free glucose content of rat diaphragm *in vitro*. Am. J. Physiol., 182, 12-16, 1955.

19. Park, C. R., and Johnson, L. H.: Effect of insulin on transport of glucose and galactose into cells of muscle and brain. Am. J. Physiol., 182:17, 1955.

20. Peters, J. P., and Van Slyke, D. D.: The Quantitative Clinical Chemistry, Interpretations. 2nd Edition. p. 258. Baltimore: The Williams and Wilkins Co., 1946.

21. Drucker, W. R., Costley, C., Stults, R., Gross, G., Holden, W. K., Miller, Max, Craig, J. W., and Woodward, H., Jr.: The effect of anesthesia on intermediary carbohydrate metabolism. Clin. Res. Proc., 3:202, 1955.

22. Lehmann, W. L.: Het Arsenigzuur als Genussmiddel by Diabetes mellitus. Arch. exp. Path. Pharmak., 2:463, 1874.

23. Peters, J. P.: Starvation diabetes, the reason for the use of glucose in the treatment of diabetic acidosis. Yale J. Biol. & Med., 17:705, 1945.

24. Wyshak, G. H., and Chaikoff, I. L.: Metabolic defects in liver of fasted rats as shown by utilization of C-14 labeled glucose and fructose. J. Biol. Chem., 200:351, 1953.

25. Weichelbaum, T. E., and Daughaday, W. H.: The rate of assimilation of fructose following intravenous administration to patients in diabetic acidosis and total pancreatectomy. J. Lab. & Clin. Med., 39: 958, 1951.

26. Darragh, J. H., Womersley, R. A., and Meroney, W. H.: Fructose in the treatment of diabetic ketosis. J. Clin. Invest., 32:562, 1953.

27. Dolger, H., Kupfer, S., Bookman, J. J., and Carr, J.: Intravenous fructose in diabetes mellitus: Advantages in the treatment of diabetic emergencies. J. Clin. Invest., 32:562, 1953.

28. McArthur, J. W., Sprague, R. C., and Mason, H. L.: The urinary excretion of corticosteroids in diabetic acidosis. J. Clin. Endocrinol., 10:307, 1950.

29. Field, J. B., and Stetten, DeWitt, Jr.: Studies on humoral insulin antagonists in diabetic acidosis. Diabetes, 5:391, 1956.

30. Seldin, D. W., and Tarail, R.: The metabolism of glucose and electrolytes in diabetic acidosis. J. Clin. Invest., 29:552, 1950.

31. Franks, M., Berris, R. F., Kaplan, N. O., and Myers, G. B.: Metabolic studies in diabetic acidosis. I. The effect of the early administration of dextrose. Arch. Int. Med., 80:739, 1947.

32. Root, H. F.: The use of insulin and abuse of glucose in the treatment of diabetic coma. J.A.M.A., 127:557, 1945.

33. Longley, R. W., Bortnick, R. J., and Roe, J. H.: Rate of glycogenesis in liver of depancreatized rat after parenteral administration of glucose and fructose. Proc. Soc. Exp. Biol. & Med., 94:108, 1957.

34. Seltzer, H. S., and Conn, J. W.: Fructose metabolism in diabetes, clinical application. J. Michigan S. M. Soc., 52:1095, 1953.

35. Conn, J. W., and Bauer, J. M.: The administration of glucose in the treatment of diabetic coma. Univ. Michigan Hosp. Bull., 11:49, 1945.

36. Himsworth, H. P.: The role of glucose in the treatment of diabetic intoxication. Lancet, 2:165, 1932.

37. Lawrence, R. D.: Treatment of diabetic coma. British M. J., 2:81, 1936.

38. Soskin, S., and Levine, R.: Carbohydrate Metabolism. 2nd edition. Chicago: Univ. of Chicago Press, 1952.

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So-called Mesenteric Adenitis

A Clinical Entity or Wastebasket Diagnosis?

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SO-CALLED mesenteric adenitis has been described in various ways by different authors. Generally it is reported to be characterized by the picture of acute, often recurrent, abdominal pain of variable severity and location, commonly in the periumbilical and right lower abdominal regions. It is reported that there may or may not be associated nausea and vomiting, diarrhea or constipation, mild fever and leukocytosis. Abdominal muscle spasm and tenderness in various areas are common. Enlarged intra-abdominal lymph nodes have been reported to be palpable. In some instances, regional or generalized lymphadenopathy is described. On occasion, malaise, headache and acute upper respiratory infections have preceded the abdominal pain. The condition has been described more commonly in children and young adults. The chief finding reported by surgeons has been enlarged mesenteric lymph nodes. Discussions as to the etiology, except from some patients with tuberculous adenitis, a condition seen more frequently in earlier years, have dealt heavily with theory and lightly on actual facts. The multiple theories as to the etiology of so-called mesenteric adenitis tend to emphasize the lack of specific knowledge, and the frequent failure of the pathologist to find an actual adenitis raises the question: Is there such an entity as mesenteric adenitis, or does the term merely signify a nonspecific condition of enlarged mesenteric lymph nodes associated with a variety of clinical states?

The current study was originally prompted by the experience of seeing a patient with idiopathic periodic peritonitis. A search of the files for records of other such cases disclosed a number of cases in which enlarged mesenteric lymph nodes were also associated with a variety of surgical conditions in the abdomen and which were labeled mesenteric adenitis. This prompted a study of all the cases in which this diagnosis had been made and an operation had been performed at the Mayo Clinic in the years 1948 through 1953.

Analysis of Cases

The series consisted of thirty-three patients. There were twenty males and thirteen females. The ages of the thirty-three patients ranged from one to fifty years; nineteen were more than fifteen years old, the ages of twelve being between twenty and thirty years with a median age of twenty for the males and of nineteen for the females.

The duration of symptoms ranged from one to fifteen years. Fourteen patients had had trouble for two or more years, and seven for five or more years. Five patients had undergone appendectomy at periods varying from three to thirteen years previously without relief of the attacks. The remaining fourteen had had only one attack prior to exploration.

Abdominal pain was the most prominent symptom, being present in thirty-two of the thirty-three cases. One patient underwent abdominal exploration solely because of profuse rectal bleeding. The primary site of pain was periumbilical or midabdominal in eleven cases, right abdominal in eight, infra-umbilical in four, epigastric in two, left abdominal in two, generalized in two and unspecified in four. The pain tended to shift to the right lower quadrant of the abdomen in thirteen cases. It was severe in thirteen, mild to moderate in seven, and absent in one; the intensity was not recorded in twelve cases.

The duration of the attacks of abdominal distress varied rather widely, from one hour to as long as four weeks. In particular, the duration was one to eleven hours in three cases, twelve to twenty-four hours in four, two to six days in eight, and more than six days in four; duration was not recorded in fourteen cases.

Laboratory and X-ray Data.—Laboratory studies did not reveal any diagnostic features and in general gave results that were nonspecific and

not helpful. The leukocyte count was 12,000 or more per cubic millimeter of blood in eleven patients. Neutrophilia was observed in six patients and eosinophilia in two (26 per cent and 15 per cent eosinophils respectively).

The sedimentation rate was less than 20 mm. in one hour (Westergren method) in fourteen of eighteen cases. Urinalysis gave no significant information.

In five patients, x-ray studies suggested abnormalities such as distended small-bowel loops, internal hernia, and intussusception. In two of these patients, operation did not confirm the suspected abnormalities.

Diagnosis.—A preoperative diagnosis of acute appendicitis was made in thirteen patients but was confirmed at exploration in only three. Meckel's diverticulum was considered among other possibilities in ten patients and found in two. Intestinal obstruction was suspected in four patients and confirmed at exploration in all four. In only one of the thirty-three patients did the clinician suspect mesenteric adenitis, and this was one of two possible diagnoses. Illustrative of the frequent lack of a clear-cut clinical picture is the fact that two or more possibilities were given as the preoperative diagnosis in thirteen cases. Among these possibilities were regional ileitis, volvulus, intussusception, adhesive bands, tumor of small bowel, irritable colon, recurring idiopathic peritonitis, mesenteric adenitis, internal hernia, mittelschmerz, and penetrating duodenal ulcer. The diagnosis was confirmed for patients having intussusception, mesenteric adenitis or penetrating duodenal ulcer and for those probably having recurring peritonitis.

Surgical Findings.—Appendectomy was performed in twenty-six patients but in only three was the appendix acutely or subacutely inflamed; in the remaining twenty-three, it showed only insignificant, chronic changes.

Enlarged mesenteric nodes constituted the only significant abnormality found at exploration in fourteen patients. In the other patients, the associated conditions found included Meckel's diverticulum (two patients), chronic cholecystitis and cholelithiasis plus duodenal ulcer (one patient), and one case each of the following: torsion of mesentery of small bowel, numerous adhesions in left upper quadrant along with perinodal inflammation, acute intestinal obstruction due to two sites of intussusception, "colitis" as described by the surgeon but with negative x-ray findings, hypertrophied Peyer's patches, intestinal obstruction due to remnant of omphalomesenteric duct, generalized inflammation with fibrinous exudate over small bowel, enlargement and thickening of small bowel, intestinal obstruction due to malrotation of cecum, and inflammation and edema of mesentery of small bowel. Five patients had a small amount of ascitic fluid, varying from serous to turbid in type.

Mesenteric lymph nodes were studied histologically in only ten patients. They showed nonspecific inflammatory changes. In two patients there were caseous granulomas of the lymph nodes, but extensive bacteriologic studies did not reveal any microorganisms including tubercle bacilli, fungi or Brucella. There was ulceration in the diverticulum of one of the two patients with Meckel's diverticulum.

Follow-up Data.—Follow-up data are scant and inconclusive. One of the three patients with acute or subacute appendicitis reported the recurrence of periumbilical pain with fever 16 months postoperatively. Follow-up information is available on only two of the 14 patients in whom nothing was found other than enlarged mesenteric lymph nodes. One of these continued to have attacks of abdominal pain 8 months after operation, while the other had had no further attacks when heard from seven months thereafter.

Among the patients who had other abdominal conditions associated with enlarged mesenteric nodes, one of the two with Meckel's diverticulum had had no recurrence of pain one year postoperatively. The patient who had numerous adhesions in the left upper part of the abdomen along with diffuse inflammation about the mesenteric nodes was continuing to have attacks of abdominal pain 14 months after operation. The patient with two intussusceptions had an episode of abdominal pain fourteen months postoperatively. The patient from whom a remnant of the omphalomesenteric duct had been removed because of intestinal obstruction was having intermittent cramps with passage of dark red blood by rectum one year postoperatively. The patient with malrotation of the cecum had an attack of abdominal pain six months after operation. The patient with diffuse inflammation and edema of the mesentery of the small bowel was apparently continuing to have attacks of pain four and one-half years postoperatively.

A patient who had considerable gray fluid in the peritoneal cavity along with enlarged mesenteric nodes and whose duodenum was not examined at exploration was subsequently found to have a duodenal ulcer. The abdominal pain of which he had complained disappeared following antiulcer therapy and did not recur during the subsequent follow-up period of five and one-half years. It does not appear that the preoperative pain was due to the duodenal ulcer, as it occurred in bouts lasting twelve to fourteen hours in association with fever and with tenderness localized in the right lower part of the abdomen.

Comment

It is evident that enlargement of mesenteric lymph nodes may occur alone or in association with a variety of pathologic states within the abdomen. The etiologic relationship between the enlarged nodes and the associated pathologic states that are described is not clear. The fact that in some patients the attacks of abdominal pain have continued after removal or correction of the pathologic conditions associated with the enlarged nodes suggests that, in some individuals at least, there may not be an etiologic relationship.

In fourteen of the thirty-three patients, enlarged mesenteric lymph nodes were the only finding noted by the surgeon. In these patients there was insignificant abnormality of the appendix. Thus, it seems that enlarged mesenteric lymph nodes may be the only finding in some patients with abdominal pain. In most of these, while the nodes may appear to the surgeon to be enlarged, an actual adenitis does not exist from the viewpoint of the pathologist. It would seem wise, therefore, that the surgeon and clinician in such instances avoid making a diagnosis of "mesenteric adenitis." A preferable diagnosis would be "indeterminate abdominal pain with enlarged mesenteric lymph nodes," care being taken to determine whether the nodes are in fact actually and significantly enlarged. Since enlarged mesenteric nodes may be associated with a large variety of intra-abdominal conditions, any one of which is capable in itself of producing abdominal pain and other clinical features ascribed to so-called mesenteric adenitis, the writer seriously questions the wisdom of making such a diagnosis even in those patients in whom at exploration enlarged mesenteric lymph nodes constitute the only finding. Such a finding is particularly common in children, and unless histologic study demonstrates definite acute or subacute inflammation or necrosis it would seem best to avoid the term "mesenteric adenitis."

This study clearly illustrates the fact that enlarged mesenteric nodes may be seen in association with a great variety of pathologic conditions within the abdomen, that a true adenitis was uncommon and that a single common specific etiologic factor was absent. The author believes it is wisest to assume that in almost all cases, enlarged and even inflamed nodes found by the surgeon should be considered the result of some other condition, even if undiscovered, which in itself is responsible for the clinical picture, rather than to assume that the symptoms are due to the adenopathy. To continue to make an unwarranted diagnosis of mesenteric adenitis is somewhat analogous to making a diagnosis of fever or leukocytosis without qualification. Surgeons and clinicians could do a real service by reserving the diagnosis of mesenteric adenitis for those patients in whom the nodes are definitely inflamed, to insist on critical pathologic and bacteriologic studies, and to consider the condition as probably a finding associated with or resulting from a more fundamental diseased state, specified if known, or designated as indeterminate if unknown.

Summary

A review of the records of thirty-three surgical patients in whom a diagnosis of mesenteric adenitis had been recorded disclosed that: (1) enlarged mesenteric lymph nodes constituted the only surgical finding in fourteen patients, (2) such nodes were associated with a wide variety of intra-abdominal pathologic states in nineteen patients, (3) a diagnosis of acute appendicitis had been made in thirteen but confirmed at exploration in only three patients, and (4) there were twenty males and thirteen females, the mean age being nineteen and one-half years.

Perhaps it might be well to discard the concept of mesenteric adenitis as a definite clinical entity. It is suggested that the designation be reserved for those cases in which there are frank inflammatory changes and that it be followed by such qualifying terms as "secondary to" or "associated with" (specifying the pathologic condition) or, when not associated with other demonstrable intra-abdominal pathologic conditions, by the term "of indeterminate etiology."

Present Status of Pituitary Hormone Preparations and Assays for Pituitary Hormones in the Blood

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UNTIL relatively recently, the study of the various anterior pituitary hormones was limited to ablation techniques to determine their biologic actions. Replacement studies utilizing crude extracts of the pituitary gland offered more refined and accurate methods of determining their individual actions. However, interdependent or synergistic actions renders accurate knowledge of their individual biologic effects difficult of determination. Indeed, some authors have been skeptical of the view that the anterior pituitary secretes a different hormone for each effect, and in at least one case, thought that somatotrophin alone, or combined with adrenal-cortical-trophic hormone, could account for all of the effects attributed to the various anterior pituitary hormones.[1] Bioassay techniques were developed and improved. With this improvement came greater purification of the various hormone preparations, and increasing evidence that physiologic differences existed. Evidence was also gathered that species differences existed for the various hormones, as to activity and characterization.[2-4] Procedures for the preparation of the purified fractions are technically difficult and time-consuming, and therefore at present are not adaptable for the routine clinical laboratory. The bioassay methods presently available suffer from the same difficulties, and in addition do not allow for accurate quantitative determinations suitable for clinical use. More sensitive procedures are needed; these depend upon the development of purified preparations and of quantitative techniques which are sensitive enough to determine the amount of the desired hormone in biological fluids.

Bioassay methods exist for the presently known pituitary hormones, but the methods of assay for the pituitary gonadotropins are the only ones used with relative frequency. This is due to the fact that the remaining hormones are present in relatively minute quantities, and procedures such as precipitation with solvents and of subsequent dialysis to concentrate the desired constituent are necessary. The bioassay procedure most used for growth hormone is that of Evans and his colleagues,[5] which depends on growth changes in hypophysectomized rats. Hypophysectomy causes regressive changes of the proximal epiphysis of the tibia; changes which are reversed by the administration of growth hormone. Other tests sometimes employed are based on a gain in weight of female rats which have attained a weight plateau, and which, on administration of growth hormone, resume their growth.

Assay procedures for thyrotropin[6] are based on three general types of assay. The first determines morphologic alterations in the thyroid gland. The second measures increase in release or uptake of iodine, and the third measures increase in the discharge of thyroxin. These require concentration of the thyrotropin, which is generally accomplished by precipitation of the blood proteins with 50 per cent alcohol; the hormone remains in the supernatant fluid and is subsequently concentrated by dialysis. Various test animals are then used, including tadpoles, chicks, and guinea pigs.

Pituitary gonadotropins are measured by somewhat similar techniques.[7] The hormone in the urine is concentrated and injected into immature rats or mice. Changes in ovarian structure or in the weight of the uterus, are measured in relation to a similar group of controls receiving saline.

Statistically speaking, however, the accuracy of these bioassay methods depends on the attention to details which are beyond the control of all but the most rigidly operated laboratories. Granted the ability to rigidly control all conditions, these

assays would appear to be capable of a quantitative estimate of the presence of the hormone to be measured to within a two-fold level which would be within the useful clinical range.

Preparation of anterior pituitary hormones and their purification in relationship to homogeneity and characterization have been reported by numerous investigators. These include somatotropin,[8,9] thyrotropin,[10] pituitary gonadotropin,[11] and interstitial-cell-stimulating hormone.[12] The methods for preparation and purification are similar for all, and have been evolved from techniques developed for animal preparations.[13-15] These techniques basically consist of homogenization of the fresh pituitaries in various solvents and by pH precipitation of the various fractions. The resultant precipitate, redissolved in various solvent solutions, or the supernatant fluid, are applied to a chromatographic column packed with a resin, the composition of which will vary depending on the material being processed. The active constituent is eluted from the column with buffered salt solutions, and may then be checked for homogeneity by other chromatographic techniques or electrophoretic studies. Purity of the various hormones achieved by these generally applied methods is apparently excellent. However, immunologically, there may be considerable contamination with other hormones.[16] The biologic activity of these preparations must still be determined by the bioassay techniques previously mentioned. The purified material thus obtained, has in some instances, been subjected to a variety of conditions, both physical and chemical, with the demonstration that the different conditions of treatment can alter the chemical structure without apparent changes in biologic activity, or conversely, diminish the activity, or ablate it entirely.[17,18]

Structurally, all of these hormones appear to be polypeptide chains with variable amino-acid content and different terminal amino-acid groups. In the case of growth hormone, the amino-acid characterization includes a terminal group reported to be phenylalanine.[19] Some of the conditions referred to above rendered this hormone biologically inactive without apparent alteration in its chemical structure. Other conditions of treatment altered the chemical composition but did not affect biologic activity. Many of the methods for preparation of the different hormones which are obtainable from pituitary glands, and which are reported to be biologically active, have not been accompanied by characterization of the fraction, which renders comparisons and interpretation of the literature difficult.

Clinically, methods for precise determination of the presence and quantity of the various hormones would be advantageous. Due to the minute quantities present in biological fluids, extremely sensitive techniques approaching the usual level of accuracy of chemical determinations are needed. Concentration techniques for the different hormones have been employed, and are feasible in at least some instances, but do not allow for precise quantitation. Immunologic techniques, as a higher level of assay procedure, offer an attractive method of approach. These methods, however, depend upon the ability of the hormones to be antigenic for animals. It has been shown that at least one such preparation, human growth hormone, is antigenic, and is capable of producing antibody of sufficiently high titer as to allow the measurement of less than one microgram of the purified preparation, employing the precipitin ring technique.[20] Other immunologic techniques could also be used with the possibility of increasing the sensitivity, such as hemagglutination techniques, or use of a hemolytic system employing sensitized erythrocytes. Such a hemolytic system has been employed in the development of a procedure for the detection of antibodies to insulin, and apparently this method can determine extremely low levels of antigen-antibody reaction. This is the bis-diazotized benzedine sensitization of erythrocytes.[21] Immunologic techniques, however, require highly purified preparations, free from all other hormone activity. As reported by one investigator, an apparently homogenous preparation of growth hormone contained sufficient contamination with another hormone so as to seriously affect the specificity of the precipitin reaction.[22] The possibility remains, however, that there may be a difference between biologic activity and immunologic specificity, although the study just cited indicated that antibody was capable of neutralizing the activity of the growth hormone used as the antigen.

As a result of the above-mentioned findings, it was suggested that a clinical application might be made of these procedures. An attempt to develop a method for the measurement of growth hormone in blood was therefore undertaken, under the guidance of Dr. James Melby, of this department. Biologic activity of the material used as the antigen in this study has been determined by Doctor

Melby. Electrophoretic studies of this material indicate that it may not be a homogenous product, but consists of what appears to be three electrophoretically-separable bands. In the absence of additional available material of sufficient purity to determine additional antigenic components by absorptive techniques, it is felt at the moment, that this method may measure other components. A brief description of the method of adaptation is presented. It is to be stated that clinical application of this method has not been attempted as yet, because of the lack of knowledge as to the specificity of the reaction, and a desire to increase the level of sensitivity of the method.

Purified human growth hormone, prepared from frozen pituitaries provided by us, and processed through the courtesy of Dr. Norman Brink, Merck and Co., Inc., Rahway, New Jersey, serves as the antigen. This material is reported to be 80 per cent protein. One milligram of hormone, calculated from the protein content, is evenly suspended in Freund's adjuvant, complete type (Difco Laboratories), to a volume of 0.4 cc. Mature New Zealand White rabbits are then injected intracutaneously with 0.1 cc. in each of four sites: over each scapula, and over each side of the sacrum. Thirty days later, a saline solution of the antigen is given intravenously via marginal ear vein; 1.0 mg. being given on day 31, 3.0 mg. on day 33, and 6.0 mg. on day 35. Ten to twelve days later, the animals are bled by cardiac puncture of 20-25 cc. of blood which is pooled. The serum is removed and stored frozen in small aliquots until use. At approximately sixty-day intervals, the series of intravenous injections is repeated, and additional blood collected in the same fashion, for a continuing harvest of antiserum. Standard precipitin ring techniques are used to determine the smallest amount of the antigen which can be detected with a 1:2 dilution of the prepared antiserum. Quantitative tests, using bis-diazotized benzedine sensitized human "O" erythrocytes in a hemagglutination reaction are then carried out. By the use of these methods, quantities of human growth hormone, as a saline solution of the antigen material, of 1 microgram or less can be definitively determined. It would appear from the reports available as to the concentration of growth hormone present in the blood, that this present level of measurement would allow determination of growth hormone content in at least some clinical conditions.[23] Attempts to utilize the sensitized cell system in a complement fixation test, to produce hemolysis which can be quantitated spectrophotometrically have so far not been successful. The presence of non-specific hemolysins renders the proportional release of hemoglobin as a function of concentration of antigen, highly inaccurate. Developmental work is hampered by small supplies of the purified human growth hormone, which is necessary for continued preparation of antibody serum and for control quantitation studies.

Summary

The present status of anterior pituitary hormone preparations is presented. The problems of their preparation and purification are briefly discused. Present methods of bioassay are outlined. An attempt to adapt immunologic methods for their measurement is presented, which, it is hoped, will be capable of further development and subsequent clinical usefulness.

References

1. Williams, R.: Textbook of Endocrinology, 2nd Edition. Philadelphia: Saunders Co., 1956.
2. Bennett, L. L., et al: J. Clin. Endocrinol., 10:492, 1950.
3. Pickford, G. E.: Endocrinology, 55:274, 1954.
4. Knobil, E., and Greep, R. O.: Fed. Proc., 15:111, 1956.
5. Evans, et al: Endocrinology, 32:13, 1945.
6. Kwa, H. G.: Acta physiol. et pharmacol. neerl., 8(1), 1959.
7. Albert, A.: Recent Progress in Hormone Research. Acad. Press, New York, 12:227. 1956.
8. Li, C. H., and Papkoff, H.: Science, 124:1293, 1956.
9. Li, C. H.: Fed. Proc., 16:775, 1957.
10. Curie, Cruickshank, and Dekanski: Nature, 178: 1172, 1958.
11. McShan, W. H., Kagawa, C. M., and Meyer, R. K.: Proc. Soc. Exper. Biol., 85:393, 1954.
12. Squire, and Li, C. H.: J. Biol. Chem., 234(3), 1959.
13. Cole, R. D., and Li, C. H.: J. Biol. Chem., 213: 197, 1955.
14. Li, C. H., Simpson, M. E., and Evans, H. M.: Science, 109:445, 1949.
15. Li, C. H., and Simpson, M. E.: Endocrinology, 27:803, 1940.
16. Cruickshank, B., and Currie, A. R.: Immunology, 1:13, 1958.
17. Ellis, S., Nada, G., and Simpson, M.: J. Biol. Chem., 218:115, 1956.
18. Li, C. H., and Papkoff, H.: J. Biol. Chem., 204: 391, 1953.
19. Li, C. H., and Chung, D.: J. Biol. Chem., 218:33, 1956.
20. Li, C. H., and Hayashida, T.: Science, 128:1276, 1958.
21. Stavitsky, A. B., and Aquilla, E. R.: Fed. Proc., 12:461, 1953.
22. Hayashida, T., and Li, C. H.: J. Immunol., 63: 487, 1958.
23. Gemzell, C. A.: J. Clin. Endocrinol., 19:1049, 1959.

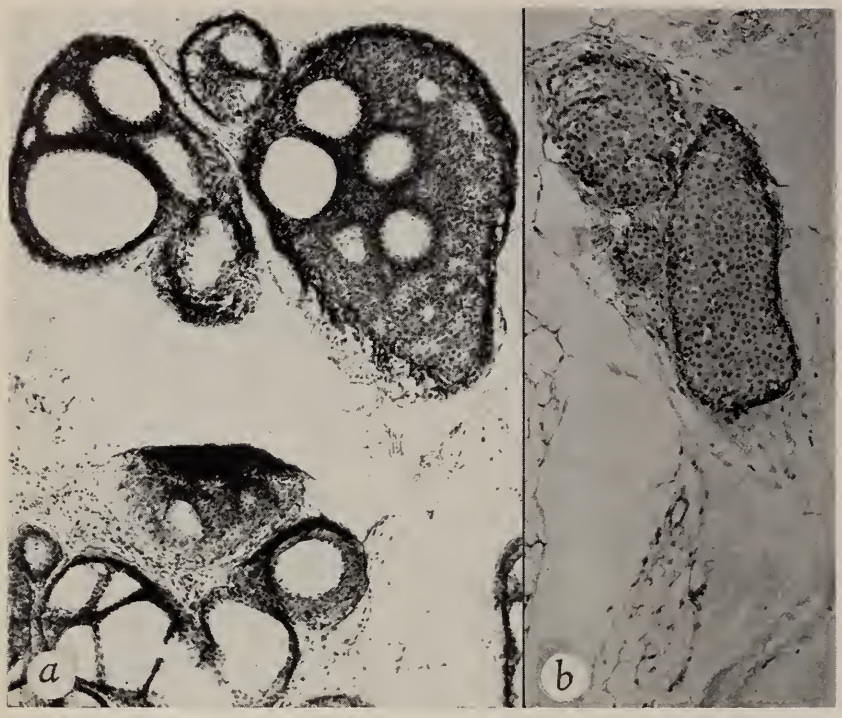
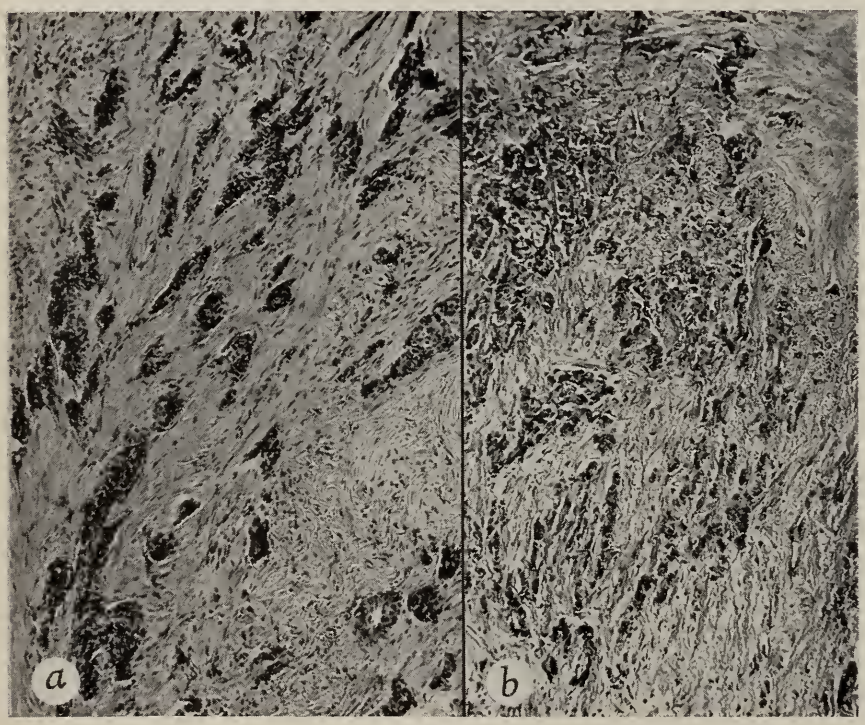


Fig. 1 (Case 1). *(a)* Well-differentiated comedocarcinoma of breast. Note cohesiveness of cells and the cribriform pattern. *(b)* Supraclavicular metastatic tumor, showing uniform cells and lack of a "single-file" arrangement (both, hematoxylin and eosin; x100).

Case Report

Long-Delayed Metastasis in Mammary Carcinoma

Fig. 2 (Case 2). *(a)* Grade 3 scirrhous adenocarcinoma of breast. *(b)* Metastatic tumor in lung, showing a similar scirrhous carcinoma (both, hematoxylin and eosin; x100).



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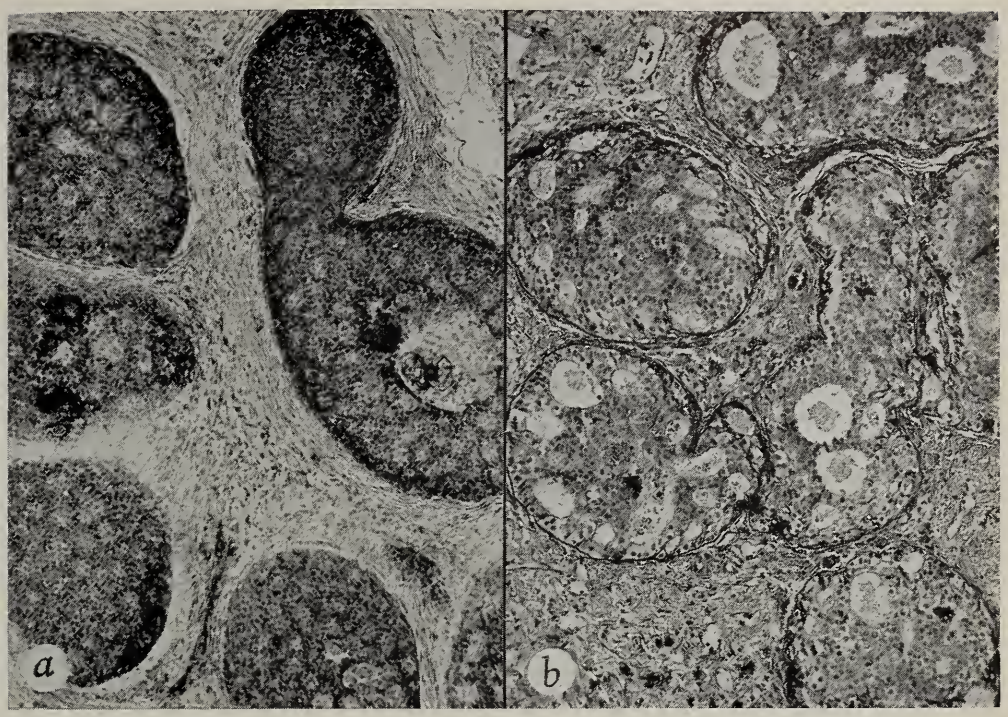


Fig. 3 (Case 3). *(a)* Comedocarcinoma of breast with focal calcification. *(b)* Metastatic tumor in lung, showing resemblance to comedo picture of primary lesion and focal calcification (both, hematoxylin and eosin; x100).

The sword of Damocles continues to hang over the head of the woman who has had a mammary carcinoma removed until she can be assured that metastasis is no longer possible. Cure often is assumed if five years have passed without recurrent lesions. In these three cases, metastasis first appeared as long as twenty-four years after the primary tumor was removed. Thus, the possibility of long-delayed metastasis should be considered in the prognosis of carcinoma of the breast.

THE concept that long-delayed metastasis may arise from neoplastic cells that have lain dormant was advocated by Willis[1], who stated that the secondary growths originated from tumor emboli present prior to surgical removal of the primary cancer. This variant in the behavior of malignant tumors is observed most commonly in carcinoma of the breast and melanoma, although latency has been noted in other cancers[2].

Chauffard[3] reported something of a record for delay in the appearance of local recurrent lesions; his patient sustained malignant recurrence in the surgical scar resulting from a mastectomy performed fifty years previously. Distant metastasis manifested as peritoneal carcinomatosis forty-one years after radical mastectomy was reported by Doyle and Hummer,[4] who demonstrated metastatic tumor cells in a peritoneal aspirate and also at necropsy.

Although delayed metastasis is reported fairly frequently,[2,5] it is probably rare in clinical practice. Hence, the following three cases are reported.

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Report of Cases

Case 1.—A thirty-six-year-old white married woman first sought medical attention at the Mayo Clinic in November 1938, in order to determine whether a relationship existed between a nodule in the right breast and pain in the right arm. The nodule had followed trauma five years previously, whereas the pain had been present for one year. One month prior to admission, she had undergone biopsy of the nodule elsewhere, and mastectomy had been advised. Positive physical findings included a healing incision of the right breast, a retroverted uterus with a small fibroid, and slight enlargement of the left lobe of the thyroid. Axillary nodes were not palpable.

Microscopic examination of the tissue brought by the patient revealed a typical low-grade comedocarcinoma of the breast (Fig. 1a). It was multicentric, and numerous ducts were distended with uniformly large hexagonal cells. A cribriform pattern was present, giving the nests of cells an aspect reminiscent of that seen in adenocarcinomas of the cylindroma type. Some periductal fibrosis was apparent, which was taken to represent a defense reaction that tended to localize the growth within the ducts. This barrier was breached in some zones, with malignant cells streaming out into the periductal fibrous tissue.

Right radical mastectomy was performed. Lymph-node metastasis was not found. Three courses of roentgen therapy followed.

The patient was examined on numerous occasions through 1956, and evidence of recurrence was absent at all times. In January 1960, she returned because of a two-year history of chronic productive cough. Hoarseness that followed a "cold" had been present for three months, accompanied by a loss of 6 pounds. Examination revealed diminished breath sounds over the posterior aspect of the right lower lung and a mass in the right supraclavicular area. Thoracic roentgenograms revealed an elevated right diaphragm, the movement of which on fluoroscopic examination appeared to be paradoxic and almost completely absent. Paralysis of the left vocal cord was noted at laryngoscopy.

Biopsy of the right supraclavicular mass revealed a nodal metastatic tumor that likewise featured a well-differentiated adenocarcinoma in which the cells were large and uniform and were growing in large clumps or aggregates (Fig. 1b). The patient subsequently received radiation therapy.

Comment.—Metastasis to the supraclavicular and mediastinal regions appeared in this patient twenty-two years after mastectomy and radiation therapy.

Case 2.—In April 1941, a fifty-one-year-old white married woman came to the clinic because of puckering of her left breast of several months' duration. In addition, she had noted soreness of the nipple for seven weeks, pain for four weeks and enlargement of the breast for seven days. Examination revealed a firm lump in the area of puckering in the left breast.

Left radical mastectomy was done. Pathologically, the mammary lesion in this case exhibited comedo features like those in Case 1, but much of the growth was typical of grade 3 scirrhous adenocarcinoma (Fig. 2a). The aggressiveness of the lesion was further apparent by the presence of metastatically involved axillary nodes. The patient subsequently received three courses of irradiation.

In July 1942, the patient received a course of irradiation for spinal pain, although abnormal findings were not elicited. She was seen at frequent intervals subsequently, with no evidence of recurrence. In October 1942, radium therapy was given for a benign, cellular, mixed tumor of the left parotid gland.

The patient was asymptomatic until March 1956, when she complained of a cough of six weeks' duration. Abnormal physical findings were not present, but roentgenograms of the thorax revealed a nodule along the right border of the heart.

Thoracotomy disclosed a nodular mass in the tip of the middle lobe of the right lung, adherent to the pericardium. Multiple small nodules characteristic of metastasis were distributed widely over the pleura. Two nodules were biopsied, and the findings were so typical of metastatic mammary carcinoma (Fig. 2b) that no thought was entertained concerning other possibilities. It was considered that nothing could be gained from resection and no therapy was given.

From October 1956 until September 1959, she was seen on five occasions for persistent cough, recurrent chills, fever, aches, and loss of weight. In September 1959, dullness with diminished breath sounds was noted at the base of the right lung. At bronchoscopy, a lesion thought to be malignant was found; however, microscopic examination revealed inflammatory changes. Radiocobalt (Co^{60}) therapy was administered.

When the patient was last examined in February 1960, fever was again present. It was attributed possibly to a current urinary infection, long-standing diverticulitis or the malignant lesion. Roentgenologic studies revealed a pleural reaction with possible effusion on the right. Antibiotics were given.

Comment.—Metastatic carcinoma of the lung developed in this patient 15 years after mastectomy for mammary carcinoma. The patient continues to live despite widespread pulmonary metastasis.

Case 3.—A fifty-one-year-old white unmarried woman was examined in February 1935, because of a tumor of the right breast of one week's duration associated with some pain, redness and soreness. Similar findings, noted one year previously, had resolved except for the presence of some local tenderness. Examination revealed a mass in the outer quadrant of the right breast, and an enlarged lymph node was felt high in the axilla.

Radical mastectomy was performed. The microscopic picture of the mammary lesion duplicated in all essential aspects that previously described in Case 1. The comedo-

carcinoma was of grade 2 malignancy, with zones of calcification (Fig. 3a). It was easy to find zones of periductal extension, and the scirrhous reaction was apparent in such localities. Axillary nodes were involved metastatically.

In July 1935, metastatic lesions were noted in the right humerus, and radiation therapy was administered; two additional courses were given in August 1935, when further progression was noted. On subsequent visits, the roentgenographic appearance of the lesions showed improvement. In 1941, another course of radiation therapy was administered for dorsal vertebral pain, although abnormalities were not found.

Periodic visits did not reveal any evidence of recurrence until August 1959. At this time, the patient complained of anginal pain and a "low blood count." The presence of pulmonary metastasis was suggested by thoracic roentgenography, and left lower lobectomy was performed. The pulmonary metastatic lesion was a well-differentiated adenocarcinoma with honeycombed plugs of malignant cells that here and there exhibited foci of calcification (Fig. 3b). Resemblance to the comedo picture of the original lesion was striking.

At her last examination in December 1959, further recurrence was not evident.

Comment.—This patient had radical mastectomy for carcinoma in 1935. Shortly thereafter, osseous metastatic lesions were discovered and treated with irradiation. Further recurrence was not observed for twenty-four years, at which time pulmonary metastasis became evident.

General Comment

As stated initially, long-delayed metastasis implies growth of latent malignant cells. The cause of this intriguing behavior of cancer, illustrated by these three cases, is probably unknown. In Cases 1 and 3, the primary lesions were well-differentiated comedocarcinomas with low potentials of growth. The tumor in Case 2 likewise exhibited comedo features. However, lack of aggressiveness cannot explain the bizarre behavior of the lesions. Thus, although the delayed recurrence in one instance was the first evidence of metastasis, long periods of restraint of growth ensued in the remaining two patients, although early metastatic lesions were found.

The arrest of growth is attributed by many investigators[6-8] to local tissue resistance. Some change in the quality or restraining influence of the tissue apparently allows regrowth of cells. Hadfield[9] thought that curtailment of growth in local lymph nodes is secondary to anoxia or to entrapment of the malignant cells in fibrous tissue. Revascularization produced by inflammation allows further regrowth. However, it is a well-documented fact that the scirrhous reaction which appears to "strangle" the cellular elements in certain instances of linitis plastica is associated with a five-year survival rate of about 5 per cent.

Gatch[10] stated that the cohesion of malignant cells provides for containment of growth, whereas loss of cohesion is followed by dissemination. In this connection, the coherent pattern of growth observed in Cases 1 and 3 is interesting.

Hadfield[9] cited experimental evidence to explain the concept of dormancy. He drew a parallel between the long survival of rapidly frozen malignant cells and the naturally occurring dormant state. The faculty for survival is attributed to intracellular dehydration, with concentration of nucleic acids. This occurs in undifferentiated paramorphic cells.

A recent report[11] by a committee of the American Medical Association noted the dramatic effect of the menopause on duration of the latent period in recurrent mammary carcinoma. In a group of forty-eight patients in whom the menopause was interposed between the primary disease and the detection of the recurrent lesions, the duration of occult metastasis averaged eighty-seven months. When both events occurred either before or after the menopause, as in 501 cases, the interval was less than half this value. In a companion editorial, Macdonald[12] stated that the group in which the menopause occurs during the latent period should be separated from any large series because it affects the survival figures disproportionately.

In our Case 1 the menopause intervened between the primary tumor and the recurrent lesions, whereas the primary growth occurred during the menopause in Case 2; the menopause antedated both events in Case 3. Thus, the menopause intervened in only one of our cases. Nevertheless, the behavior of the latent cells apparently is considerably influenced by the hormonal environment.

Some insight into this problem may be gained by examining some recent advances in the field of cancer immunology.[13-16] A recent review by Black and Speer[13] is pertinent and forms the basis of much that follows. Current thought suggests that canceration of cells is frequently, if not always, associated with variable degrees of new antigenic changes. The latter may be the result of the creation of new antigens or the partial depletion of "normal identity" antigens or both.[13]

In carcinoma of the breast, the presence of lymphoid infiltration in the primary tumor,[17] sinus histiocytosis,[18] and metallophilia[19] in the local lymph nodes has been interpreted by some observers as evidence of local antigenic response to malignant growth. Systemic manifestations suggesting antigenic response are the demonstration of circulating antibodies,[20] increase of serum globulin (especially the alpha fraction), depression of properdin levels,[21] and the presence of hemolytic anemia.

Colonic carcinoma gives little evidence for antigenic response, such as lymphocytic infiltration or sinus histiocytosis.[13] Perhaps the theory of a deficiency of "identity proteins"[22] (antigens) is more attractive here. This deficit of proteins could follow viral invasion, radiation and hyperplasia. With this deficiency of "identity marker" but not to a degree that prevents recognition, the cell does not elicit the usual regulating immunologic mechanisms. Miller and Miller[23] postulated gradations of depletion, with the most severe degree causing death of the malignant cell, a less severe alteration permitting survival with limited growth, and the least change permitting a potential for unlimited growth.

According to these theories, clinical aggressiveness would predominate when growth potential was high but the antigenicity of tumor cells or the responsiveness of the host or both were minimal; prolonged survival would be expected with low growth potential or a high degree of antigenicity and host responsiveness or both.[13] Latency could be visualized in the light of this immunologic host-tumor concept. Apparently the antigenic response to the host is such that for long periods, curtailment of growth occurs; with alteration in this status, the period of latency is terminated and uncontrolled proliferation of malignant cells ensues. Actually, long-delayed metastasis may well support the validity of this immunologic concept. Indeed, as Black and associates[24] advocated, the classic concept, which interprets cancer as a malignant primary lesion with linear temporal dissemination, needs reappraisal.

Summary

Three cases are reported in which long-delayed metastatic lesions from carcinoma of the breast occurred after intervals of twenty-two, fifteen, and twenty-four years, respectively. This intriguing behavior is best explained as a variation in the host-tumor relationship, in which the potential for growth is the reciprocal of tumor antigenicity or host responsiveness, or both.

References

1. Willis, R. A.: The Spread of Tumors in the Human Body. p. 81. London: Butterworth & Co., Ltd., 1952.
2. Morton, J. J., Jr., and Morton, J. H.: Cancer as a chronic disease. Ann. Surg., 137:683, 1953.
3. Chauffard: Quoted by Morton, J. J., Jr., and Morton, J. H.[2]
4. Doyle, J. C., and Hummer, G. J.: Peritoneal carcinomatosis forty-one years after radical mastectomy. J.A.M.A., 149:1543, 1952.
5. Woolsey, George: Late recurrence after radical operation for carcinoma of the breast. Ann. Surg., 80:932, 1924.
6. Dunphy, J. E.: Some observations on the natural behavior of cancer in man. New England J. Med., 242:167, 1950.
7. Ficarra, B. J.: Postmortem observations twenty years after bilateral mastectomy. J.A.M.A., 150:478, 1952.
8. Gatch, W. D., and Culbertson, C. G.: Theories on the treatment of breast cancer and observations on its natural course. Ann. Surg., 135:775, 1952.
9. Hadfield, Geoffrey: The dormant cancer cell. Brit. M. J., 2:607, 1954.
10. Gatch, W. D.: Degree of cohesion of cancer cells and its relation to cancer spread. A.M.A. Arch. Surg., 74:753, 1957.
11. Council on Drugs: Androgens and estrogens in the treatment of disseminated mammary carcinoma. Retrospective study of nine hundred forty-four patients. J.A.M.A., 172:1271, 1960.
12. Macdonald, Ian: Sex steroids for palliation of disseminated mammary carcinoma: Guest editorial. J.A.M.A., 172:1288, 1960.
13. Black, M. M., and Speer, F. D.: Immunology of cancer. Internat. Abstr. Surg., 109:105, 1959.
14. Moore, G. E., and Grace, J. T.: Cancer immunity. Surg., Gynec. & Obst., 110:234, 1960.
15. Syverton, J. T.: Preface to immunology and cancer. Ann. New York Acad. Sc., 69:528, 1957.
16. Vygodchikov, G. V.: Pathogenesis and Immunology of Tumors. (Translated by R. Crawford.) 258 pp. New York: Pergamon Press, 1959.
17. Black, M. M., Speer, F. D., and Opler, S. R.: Structural representations of tumor-host relationship in mammary carcinoma: Biologic and prognostic significance. Am. J. Clin. Path., 26:250, 1956.
18. Black, M. M., and Speer, F. D.: Sinus histiocytosis of lymph nodes in cancer. Surg., Gynec. & Obst., 106:163, 1958.
19. Black, M. M., and Speer, F. D.: Lymph node structure and metallophilia in tumor-bearing mice. A.M.A. Arch. Path., 67:58, 1959.
20. Graham, J. B., and Graham, Ruth: Antibodies elicited by cancer in patients. Cancer, 8:409, 1955.
21. Rottino, Antonio, Levy, A. L., and Conte, Alexander: A study of the serum properdin levels of patients with malignant tumors. Cancer, 11:351, 1958.
22. Green, H. N.: An immunological concept of cancer: A preliminary report. Brit. M.J., 2:1374, 1954.
23. Miller, Elizabeth, and Miller, J. A.: *In vivo* combinations between carcinogenic and tissue constituents and their possible role in carcinogenesis. Cancer Res., 12:547, 1952.
24. Black, M. M., Speer, F. D., and Opler, S. R.: Some components of biologic predeterminism in cancer. Internat. Abstr. Surg., 102:223, 1956.

Case Report

Three Malignancies in One Patient

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Read at the annual meeting of the Southern Minnesota Medical Association, Minnesota, September 14, 1959.

THIS IS a case of a twenty-five-year-old white woman who was first seen in November, 1955. She came to the office for the care of her first pregnancy. Her past history revealed that she had enjoyed good health, with the exception of having had an appendectomy in 1949 and later a pelvic inflammatory disease which cleared uneventfully under treatment. Physical examination revealed the patient to be approximately two and one-half months pregnant. She went to term, delivering a normal 6-pound, 2-ounce girl on May 15, 1956.

In November, 1957, the patient had what was thought to be a spontaneous complete abortion at two months in her home.

In August, 1958, the patient again came to the office for the care of a pregnancy. Physical examination indicated she was a little over two months pregnant, the estimated date of confine-

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The illustrations are of tissue taken from the original surgery done in April, 1959.

1. Gross specimen of ovarian tumor comprised of dysgerminoma and teratocarcinoma.

2. Microscopic section showing junction of the two tumors of the ovary.

3. Microscopic section of the cervix showing the carcinoma *in situ*.

ment being February 22, 1959. Her pregnancy was uneventful except for an upper respiratory infection and a non-specific vaginitis in January, 1959. Under treatment, both of these conditions were relieved. On February 25, 1959, the patient delivered a normal 7-pound boy uneventfully. After a five-day hospital stay she was discharged.

On April 10, 1959, the patient returned to the office for her six weeks' post-partum examination. At this time a leukoplakia was discovered on the anterior lip of the cervix from which a Papanicolau smear was taken. The smear was reported to contain many malignant cells. Therefore, the patient was hospitalized and on April 17, 1959, a cervical amputation was done by Dr. D. K. Holian, of Albert Lea, and myself. At the end of this procedure, a pelvic examination revealed a right adnexal mass, previously not discovered. Consequently, three days later, a pelvic laparotomy was done which revealed the presence of an ovarian mass on the right side, approximately 6 to 7 centimeters in diameter, lying high in the posterior cul-de-sac. A frozen section of the mass indicated this to be a malignancy. Therefore, a panhysterectomy was done, along with removal of the peritoneum against which the mass was lying. No nodes or evidence of metastases were found. The patient recovered promptly from the surgery and was discharged from the hospital on Premarin 2.5 mg. four times a day. Soon after her discharge she developed a cystitis which cleared well on Furadantin 100 mg. three times a day.

On June 5, 1959, an Ascheim-Zondek test was run on a twenty-four-hour urine specimen and reported normal at 2500 to 3000 rat units. The normal for a three-month pregnant woman is approximately 50,000 rat units. This test was repeated during the first part of September with a result of 15 to 20 rat units.

The final pathology report from Dr. E. C. Menefee of Naeve Hospital, Albert Lea, was: (1) carcinoma *in situ* of the cervix; leukoplakia of the cervix and chronic cervicitis, (2) uterus with no residual carcinoma, (3) endometriosis of the right ovary and dysgerminoma of the right ovary associated with a teratocarcinoma of the right ovary, (4) no tumor invasion of the peritoneum specimens.

Summary

A twenty-five-year-old white woman, Gravida III, Para II, AB I was found to have a leukoplakia at her six-weeks' postpartum examination, confirmed by a Papanicolau smear. After amputation of the cervix, a right adnexal mass was discovered, and three days later a pelvic laparotomy was performed. Because of the presence of a large malignant tumor of the right ovary, a panhysterectomy was done. The pathologist's report included the following: (1) carcinoma *in situ* of the cervix, (2) dysgerminoma of the right ovary, (3) teratocarcinoma of the right ovary.

This case was of special interest to us because of the presence of three distinct malignancies in such a young patient. This case also supports the contention that regardless of age or physiological conditions, such as pregnancy, a Papanicolau smear can be justified to instigate procedures that may well save or prolong the life of the patient.

Sequel

Since the original report of this case, the following history may be recorded. Because of persistent bloating, obstipation, vomiting, and lower abdominal pain, the patient was readmitted to the hospital on October 5, 1959. The next day, a pelvic laparotomy was done and several omental and pelvic metastases were discovered. The liver was not involved grossly. A tumor, measuring 4 x 6 cm. was removed and the wound closed. The pathology report was: metastatic, anaplastic carcinoma (primary teratocarcinoma of the ovary). The patient was discharged on October 11, 1959.

Symptoms of partial small bowel obstruction soon reappeared and on November 13, 1959, the patient was again admitted to the hospital. Supportive treatment was offered and the patient expired on November 30, 1959. Permission for an autopsy was not granted.

The Story of Diphtheria

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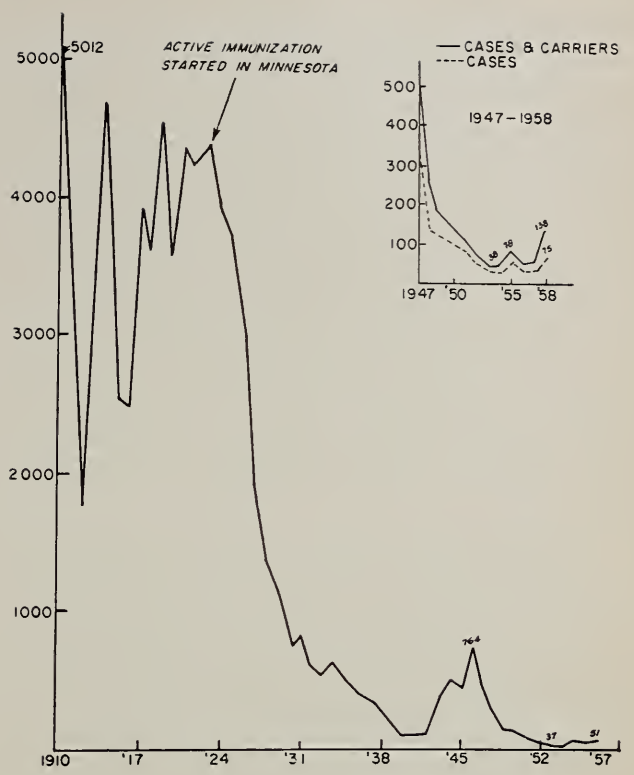


Fig. 1. Cases of diphtheria (plus carriers) in Minnesota, 1910-1958.

Presented at the meeting of the Minnesota Academy of Medicine, February 10, 1960.

DIPHTHERIA, a disease so ancient that its origins are uncertain, possesses a strange and fascinating history. It was truly a killer, and it struck children with dreadful severity. In the Minnesota north country, diphtheria was the persistent enemy of the pioneer, and, as late as 1910, there were in this state 566 deaths attributed to it. During the fifteen years following 1910, the mortality rate varied from 354 to 170 per year. In 1927, for the first time, the number of persons slain by the diphtheria was less than a hundred. The eventual conquest of such a killer should delight every physician, and it is the narrative of this triumph that I wish to sketch for you in the brief period allotted to me.

Fortunately, the history of diphtheria conveniently divides itself into six phases: (1) the development of the clinical picture, (2) the recognition of the disease's contagiousness and epidemicity, (3) the croup problem, (4) the discovery of the diphtheria bacillus, (5) the development of passive immunization with antitoxin, (6) the development of active immunization with toxin-antitoxin and, later, with toxoid.

Development of Clinical Picture

The development of the clinical picture, which brings us to the mysterious problem of the age of the disease, is, indeed, fascinating. Actually, no one can tell with exactness when diphtheria first appeared, because palaeopathology has not been able to prove its existence in prehistoric times.

However, Hippocrates apparently described a disease which can be identified with a fair degree of certainty as diphtheria. He used the name *cynanche,* a term which remained in medical literature until the nineteenth century. The word was derived from the terms *kyon,* meaning dog, and *anchein,* meaning to strangle. Later, it was applied to all types of obstructive conditions as the result of which a patient seemed to pant like a dog. Hippocrates mentioned the difficulties in deglutition, the escape of fluid through the nose when liquids were taken, the nasal voice, and the inability to stand upright. He also included in the term various forms of throat and laryngeal afflictions.

The next step was made in Galen's time, when a distinction was made between *synanche,* throat diseases, and *cynanche,* laryngeal affections. It was during this period that the term *angina* made its appearance and was used in the same sense. There is only one other chronological point to mention. If Susruta's medical writing is as old as is claimed, it may be that his description of the disease *Valasa,* as found in Sanskrit medicine, is, indeed, diphtheria and, therefore, ante-dates Hippocrates. Susruta wrote of a disease having the characteristics of painful swelling of the throat, difficulties in breathing, and, finally, asphyxia.

Conjecture flees before fact, however, in the writings of Aretaeus Cappadox, who usually is given credit for the first good description of diphtheria. This astute individual, straddling the first and second centuries A.D., wrote his excellent *Causes and Symptoms of Acute Diseases.* In it he described "ulcerations about the tonsils," which, he claimed, were called Syrian or Egyptian ulcers because of their prevalence in those countries. Many of the symptoms he described sound like those of diphtheria—the sore throat, the aphthae or ulcers in the throat, the inflammation of the neck glands, the involvement of the uvula, the hoarseness, and frequently sudden death. Aretaeus stated also that children up to the age of puberty were particularly prone to the disease.

During the sixth century, Aetius of Amida also described a similar condition and added the important statement that, when the throat healed, there might be some difficulty with the voice and that the patient might regurgitate fluids through the nose. He thus recognized post-diphtheritic paralysis.

During the next thousand years after the sixth century, only two or three accounts which conceivably might have been diphtheria appeared in the literature. It is true, of course, that, during the twelfth and thirteenth centuries, Gilbertus Anglicanus wrote of a Quincy-like sore throat which he called *squinantia* and which occasionally caused death by suffocation. And John Arderne, in the fourteenth century, gave the name *squynancy* to describe similar cases which he observed in England.

Recognition of Contagiousness and Epidemicity

By the sixteenth century, the disease had taken on epidemic proportions in the Low Countries, in the Rhine provinces, and in France. At this time we get the first unequivocal account of the disease. It was written by Guillaume de Baillou, who, by the way, has to his credit the first clear description of whooping cough. In the winter of 1576-1577, a surgeon told Baillou of an infant who had evidently died of laryngeal diphtheria. Autopsy showed a membrane in the larynx. Baillou could relate other like cases. His book, however, did not appear until 1640, twenty-four years after his death.

During the later part of the sixteenth century and throughout much of the seventeenth century, there were disastrous epidemics in Portugal, Spain, and in France. As a result, a voluminous literature developed in which many of the well-known names for diphtheria were coined. The Spanish used the name *garotillo,* because death from diphtheria reminded them of the effects of garotting, their national method of executing criminals. *Morbus suffocans* and *morbus strangulatorius* convey the same idea. Other writers, saying that the main symptoms are found in the throat, use the terms *anginosa passio* or *ulcera anginosa.*

Villa Real, an early Spanish writer, first mentioned the painlessness of the condition and the high mortality of the hemorrhagic form in his *De signis, causis, essentia, prognostico et curatione morbi suffocantis,* which was published in 1611. In 1620, Johannes Andreas Sgambatus gave the first modern account of diphtheria when he described an epidemic in Naples in his *De pestilente faucium affectu Neapoli.* Real wrote that the membrane formation does not necessarily lead to ulcerations. Cutaneous diphtheria first was mentioned by Perez de Herrera in 1615. He used the name *morbus*

suffocans garrotillo to describe the disease. Another Italian of the period, Aetius Cletus, wrote of the *morbus strangulatarius,* pointing out once again the characteristic paralysis. But he is clearer on this point than those before him, for he discussed both the difficulties in speech articulation and the nasal voice. It is significant to note that most of the authors of this period recognized the contagiousness and the epidemicity of diphtheria.

It may be worthwhile to note that perhaps the earliest illustration of a bronchial cast—probably diphtheritic—was published in 1641 in the *Observationes medicae* by Nicholas Tulp, who is so well known from Rembrandt's "Anatomy."

Five years later, in 1646, Thomas Bartholin published in Paris a volume describing the Italian epidemics. In this he gave a clear clinical appraisal of diphtheria, including its contagiousness and its toxic effects on the nervous system. He specifically mentioned paralytic strabismus in a child. He discussed also the advisability of tracheotomy. Indeed, it was at his request that Moreau of Paris wrote a short treatise on tracheotomy. This was printed with Bartholin's booklet. Moreau was competent, for he had successfully carried out this operation on two adults. He felt it should be used also on children to prevent death from asphyxiation.

As is generally true, the interest of the medical profession and the amount of literature decreased or increased in relation to the easing off of epidemics or their mounting severity. The late seventeenth century witnessed a marked increase of diphtheria epidemics, both in Europe and in America. Thus it was that a rash of literature began appearing on this side of the Atlantic, for diphtheria increased in the New World during the late seventeenth century and even more during the following century. When Cotton Mather wrote of the occurrence in 1659 of the "Malady of Bladders in the Windpipe" he thought he was dealing with a disease unknown in America. Yet, between 1735 and the 1750s, most of the New England states were to be ravaged by the disease. And there is no doubt but that the term "throat distemper" included diphtheria as well as scarlet fever. Writers wrote of swollen tonsils with membranes, marked general weakness, and skin eruptions. Samuel Bard of New York showed, by means of autopsies, the membrane formation in the trachea in every case of diphtheria. In 1771, he published his famous treatise, *An inquiry into the nature, cause and cure of the angina suffocative, or sore throat distemper, as it is commonly called by the inhabitants of this city and colony.*

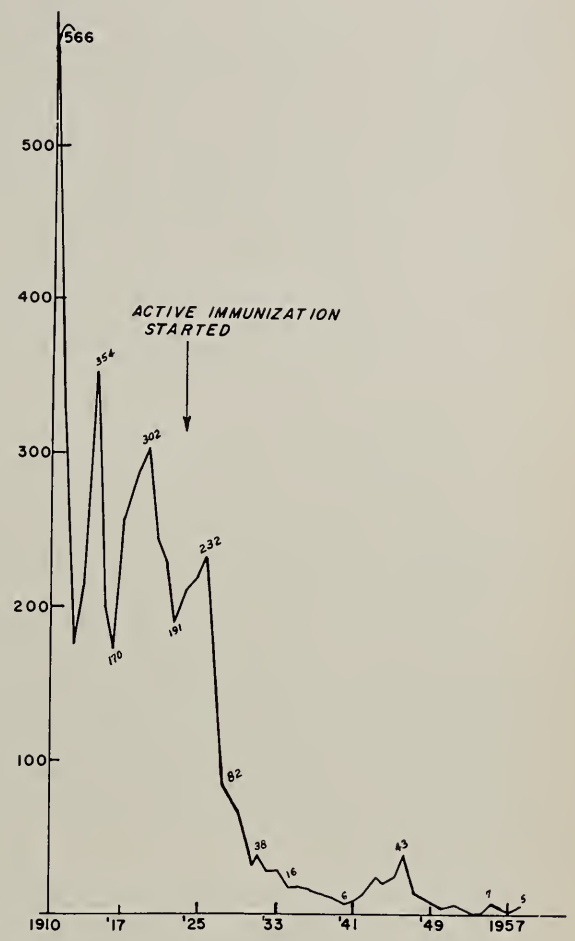


Fig. 2. Deaths from diphtheria in Minnesota, 1910-1958.

In Europe, diphtheria epidemics continued in decade after decade, so that numerous outstanding physicians became interested in the disease. Among these was John Fothergill, distinguished English clinician, who published his *Account of the sore throat attended with ulcers* in 1748. Most of the cases he reported, however, suffered from scarlet fever. Although it was occasionally suspected that two different diseases were confused one with the other, the distinction was not sufficiently clear to be accepted generally by the medical profession.

The Croup Problem

This confusion was compounded when Francis Home published in 1765 his famous *An inquiry into the nature, cause and cure of the croup,* a book

that became most popular. Home introduced the word *croup* into medical literature, taking it from the old Scotch word which meant the croaking noise of frogs or birds, and of children with laryngeal obstructions. It was used as a verb as early as the sixteenth century, but the noun did not appear until the eighteenth century. The confusion was manifested further in other designations of laryngeal afflictions—false croup, spasmodic croup, membranous croup, diphtheritic croup. In France, *croup* became synonymous with diphtheria. Many pamphlets and dissertations thus spoke of *angina membranacea vulgo croup vocata.* The Germans also adopted this word—especially the adjective—using either the German *crupöse* or the Latin *cruposus* to indicate an inflammatory condition accompanied by a thick exudate—croupous pneumonia, croupous laryngitis, etc.

The French were so conscious of the prevailing confusion that they offered prizes for the best clarifying essays. Such awards were sponsored by the Royal Society of Medicine of Paris in 1783 and by Napoleon in 1807. Napoleon was especially interested, for he was affected by the death from croup of Louis Bonaparte's son. The questions put to the essayists were: did croup actually exist in France? what were the signs to warrant the diagnosis of croup? what treatment was to be used?

It remained, however, for Bretonneau, Trousseau, and their fellow workers to place the whole question of diphtheria on a sound basis. Pierre-Fidèle Bretonneau, chief physician of the general hospital at Tours, was a fine clinician. With Dypuytren and Laennec, he had been a pupil of the great Corvisart. Among Bretonneau's achievements was his recognition of the intestinal lesions in typhoid fever. He had been able to observe, between 1818 and 1820, epidemics among soldiers and civilians. In soldiers, the disease, which was a condition of the mouth, was considered as a "scorbutic gangrene." Among civilians, it was thought of as a malignant angina. Bretonneau, after careful observations and sixty-one autopsies, wrote in 1826 his famous work on inflammations of the mucous membranes, which gave emphasis to diphtheria or membranous inflammation. With the publication of this distinguished volume, *diphtheria* (or *diphtherite* as Bretonneau termed the disease) was established as a specific disease. The word was coined from the Greek *diphthera,* which means a piece of leather. In 1855, Bretonneau altered the term to *diphtherie,* the equivalent of our diphtheria.

Bretonneau was convinced not only of the specificity of diphtheria but also of its contagiousness. He also suspected a single causative agent. This recognition of the identity of croup and malignant sore throat and of Bard's *angina suffacativa* had not been made clear since the work of Aretaeus during the first and second centuries. But this is not all. Bretonneau is important in the history of diphtheria for another reason: supposedly he carried out the first successful tracheotomy on a child suffering from the disease. This was done at Tours in 1825. One of his pupils, Armand Trusseau, later one of the greatest of French clinicians, popularized Bretonneau's ideas, favored tracheotomy, and performed the first one in Paris. It is said that he cured nine out of thirty-six patients by this operation.

Discovery of the Diphtheria Bacillus

After the middle of the nineteenth century, between 1856 and 1858, diphtheria epidemics became so widespread that medical authors began to speak of a pandemic. Thus investigations were increased and applications of all new medical knowledge were used. It is at this point that the period of experimental investigation begins. The result was that there was successful transmission to animals. This work was done by Friedrich Trendelenburg and Max Joseph Oertel in 1870. The next landmark was long in coming. Not until 1883 did Edwin Klebs find the causative agent of the disease. In Kleb's first report, he stated that he found bacteria only in the membrane and in no other portions of the body. A year later these findings were confirmed by Friedrich Loeffler, Koch's assistant, in the latter's Berlin institute. Loeffler made use of Koch's development, in 1881, of plates for cultures, confirmed most of Kleb's findings, and proved the susceptibility of animals. But even more significant was the fact that he found virulent diphtheria bacilli in a healthy child.

Although by the 1880's the knowledge of diphtheria had increased considerably, there were still problems. As yet no specific treatment had been devised. It was, of course, only natural, that physicians were particularly concerned both with the obstructive symptoms and with the techniques to

avert death from asphyxia. Successes with tracheotomy had not been too satisfactory. It was too formidable an undertaking for many physicians and procrastination, no doubt, was one of the reasons for so many failures. A substitute was needed that would be less drastic and would take the form of intubation of the larynx. This was found by Bouchut in Paris in 1858 and was termed *tubage*. Bouchut's early trials were not altogether successful, and of, course, there was opposition by Trousseau, who championed tracheotomy. A Scotsman, William Macewen, it will be remembered, used some kind of a catheter in 1881 with moderate success, but it must also be recalled that the catheter technique had been used by Desault before 1800. This apparently was not true intubation.

The technique was perfected after four years of work by Joseph O'Dwyer, who, in 1885, published the results of his experiments in the *New York Medical Journal*. A careful worker, O'Dwyer produced a tube that fitted exactly the inside of the larynx. His tube had a bulge so as to make expulsion by cough difficult. It was fashioned also so as not to slip into the trachea. The O'Dwyer tube, however, was not to become general until the serum treatment had been developed during the next decade. It is pleasant to say that the O'Dwyer method met with less opposition than is usually directed against radical innovations. It may be of interest to you that the intubation set now displayed in the museum of the Ramsey County Medical Society came from Dr. O'Dwyer himself. He presented it to Dr. James T. Christison, one of the pioneer pediatricians of St. Paul. Despite the rather general acceptance of the O'Dwyer method of intubation, there was a certain difference of opinion among members of the medical profession as to the relative merits of intubation and tracheotomy. During the past twenty or thirty years, intubation has practically disappeared.

Development of Passive Immunization with Antitoxin

Despite all this progress, a number of problems still awaited solution. These included the production of various symptoms of the disease, its treatment, and its prevention. That bacteria could not be found in internal organs was, of course, known as the result of the work of Klebs and Loeffler. It was therefore suspected that the bacilli produced a toxin. Emile Roux and Alexandre Yersin proved this to be so. They separated the toxin from the bacteria. When animals were inoculated with the toxin they showed diphtheria symptoms, resulting in death. The first animal work was done by Karl Fraenkel, who, in December 1890, immunized guinea pigs with attenuated diphtheria bacilli. On the day following publication of Fraenkel's guinea pig experiments, two other researchers, Emil von Behring and Shibasaburo Kitasato, published similar papers telling of their successes with immunization against tetanus. These two pointed out that the cell-free blood serum had the capacity of counteracting the toxin in animals. About the same time, Behring found the same to be true for diphtheria. These findings, then, were the foundation for the next, dramatic step. On Christmas night a year later, diphtheria antitoxin first was used on a child. Yet the technique did not become popular immediately. Several years were to elapse before the treatment became popular and to make serum available to those who wished it. Not until 1894-1895 did the treatment come to be accepted generally.

The first municipally operated health laboratory was established in New York City in 1892. There, a year later, bacteriological work on diphtheria was begun by William Hallock Park and his assistant, Alfred L. Beebe. These men showed the importance of carriers, and emphasized the necessity of taking cultures from well contacts in households where diphtheria was present.

Development of Active Immunization with Toxin-Antitoxin and with Toxoid

But, although now diphtheria could be diagnosed, carriers identified, and treatment begun, there remained two areas still to be developed. Prevention and control, in addition to isolation and quarantine, now hung upon the introduction of mass immunization. Animal immunization had been demonstrated in 1890. The next step was taken by Dziergowski. In 1902, he used diluted toxin in humans and thus was successful with active immunization. Theobald Smith suggested a neutralized toxin-antitoxin mixture, in 1909. In 1913, Behring, who had been experimenting with diluted antitoxin alone, successfully used a toxin-antitoxin mixture. In the same year, Bela Schick supplied a guide with minute amounts of toxin to be used for the several age groups and for purposes

of mass immunization. His test was also the means of getting the answer to the results of such immunization.

It was known, of course, that diphtheria toxin could be altered and mitigated by the application of either cold or heat, but it was most difficult to standardize, in dependable fashion, such treatment of the toxin. When, therefore, G. Ramon developed his formalin treatment and produced anatoxin, the toxin-antitoxin mixture was discarded quickly. This was especially true when reports of anaphylactic shock began to mount. The formalin treatment later was replaced by alum-precipitation, and this product, now known as alum precipitated toxoid, has been in use for over a quarter of a century.

The first mass immunization in the United States was begun in New York City, where by 1928, half a million children had been immunized. It was estimated that by 1940 about sixty per cent of all New York City children had received the preventive treatment. Mortality had decreased from 705 per 100,000 in 1894 to only 1.1 in 1940. It must be noted, however, that there was a spontaneous improvement in the morbidity and mortality of diphtheria. In New York in 1910, the mortality from diphtheria in children under ten years of age was only 300 per 100,000. This decline started before antitoxin was used extensively. By 1920, the mortality fell below 100. And this took place before active immunization really was in progress.

Minnesota figures tell the same story. In 1910, there were 5,012 reported cases of diphtheria. From that year until 1923, when active immunization began, the number of cases varied between 2,500 and 4,500 annually. Five hundred and sixty-six persons died from the disease in 1910. However, during the following fifteen years, the number of deaths varied from 170 to 350 per year. It is interesting to point out also that, although immunization began in 1923, there were 232 deaths in 1925. Then a rapid decline set in. By 1930, only 768 cases (plus carriers) and thirty-two deaths were reported. In 1950, in Minnesota there were ninety-nine clinical cases, thirty-seven carriers, and only eight deaths. The lowest point was reached in 1954 with fifty-four cases, thirty-seven carriers, and two deaths. In 1958, there were 138 cases and five deaths.

These figures, the result of long years of toil and patient research by men in many lands, show clearly that only continual and persistent watchfulness can keep diphtheria in shackles and under control. Epidemics do not die out completely. Yet this short narrative of diphtheria and its conquest is one of which the medical profession can be justly proud.

MUSEUM OF MEDICAL PROGRESS OPENS IN PRAIRIE DU CHIEN, WISCONSIN

The Wisconsin Museum of Medical Progress, designed to carry historic and modern stories of medicine to the public, opened September 1, 1960, in Prairie du Chien, Wisconsin. A project of the Charitable, Educational and Scientific Foundation of the State Medical Society of Wisconsin, the museum is being financed by the contributions of physicians and other interested persons. It will be operated by the State Historical Society of Wisconsin. The museum is housed in the restored military hospital of Old Fort Crawford. It will tell medicine's story in a series of thirty-four displays and exhibits.

One series of exhibits traces medicine from the days of Indian cures to the "horse and buggy" doctor of the early twentieth century. A second series concerns Dr. Wm. Beaumont's contribution to medicine—treating an Indian guide with a gunshot wound and conducting experiments on digestion, the results of which provided the "basis of modern understanding of the physiology of digestion." A third major theme traces the development of medicine from the days of early quackery and "diploma mills" through the consequent establishment of the State Medical Society and the American Medical Association and the development of medical education.

On the basis of work started in 1931, the State Society, in 1954, established a Section on Medical History to begin collecting materials for the museum.

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.

CLINICAL PARTY CONFERENCE

(Comparative Case Studies)

Patient 1	Patient 2

Chief Characteristics

Promotion of a trend, certain to terminate in socialism or a totalitarian welfare.	Preservation of controlled, competitive, free enterprise or the essence of Democracy.

Family History

1. Professed champion of the minorities.	1. Advocate of individualism, prudence, industry, ability, higher education, and all their rewards for members of all races and religions—the mainstay in the American Way of Life.
2. Power through appealing to the "less fortunate", those who work for a living.	2. Compassion and care for the truly unfortunate through aid to and control on the local basis (with free choice of physician).
3. Monopoly and centralization of government or maximum nationalization.	3. Decentralization of government or spread of authority to the states.
4. Generous with the people's monies probably to the degree of bankruptcy—(Khrushchev's favorite party).	4. Pay as you go program or fiscal responsibility.
5. Soak the greedy, glutted rich (incomes $675.00 a year and up plus "hidden taxes" and spiralling prices for every one).	5. Spare the goose that lays the eggs of gold.
6. Quick rewards through share the wealth programs for the "worker" eventually at a cost of a loss of personal dignity and human rights.	6. Success of individuals through rendering better competitive service or creative ability which has given us an unprecedented prosperity never experienced by man.

Present History

(pertaining to medicine)

1. Promotion of enforced governmental "free" medical care. (a) Wagner-Murray-Dingell Bill. (b) Murray-Dingell Bill. (c) Forand Bill. (d) Humphrey Bill 2009 (e) Any "foot-in-the-door" bill.	1. Opposition to all legislation leading to socialization of medicine.
	2. Proposes Mills bill (H.R. 12580 AMA approved) health care for the near needy elder citizens.
	3. Promotion of voluntary choice of private, competitive insurance for both medical and hospital services. (a) In this decade has temporarily turned the tide of a nation headed for governmental medicine. (b) Seventy million people have chosen private medical care insurance coverage.
2. Advocates of "free" medical care of non-service connected illnesses of veterans and their families.	4. Little opposition or action on non-service connected illness.

Predicted Sequelae

1. Complete socialization of medicine.
   (a) The greatest catastrophy ever to befall the people and physicians.
   (b) Monopoly of medical service and hospitalization by government.
   (c) Precipitous decline in quality and quantity of medical school student applicants (presently being experienced because of instability and anticipation).
   (d) Stagnation and slow deterioration of medical service.
   (e) "The government owes me a living" attitude.
   (f) Loss of present physician-patient relationship.
   (g) Limited choice of physician.
   (h) Layman control of physicians and patient care.
   (i) Limited salary but maximum security for physicians.
   (j) Deluge of demands for care of minor complaints.
   (k) An overwhelming cost to every wage earner for mediocre medical care and armies of government bookkeepers.
   (l) Regimentation of physicians by government and labor union policies: 40 hour week, 5 P.M. curfew, promotion by seniority rights or political skills, "feather bedding", strikes (Norway, England), intrinsically controlled limited service, closed shop (English panels), healing cult equality.
2. Gain control of medicine then—complete socialization will be easy (a Marxism). Result—"Cradle to grave" care of the people.
3. "England will not be conquered but will legislate herself into communism"—Carl Marx. How about the U.S.A.?
4. Road back to health will be long and arduous, indeed if health seems worth the effort to those who retain a spark of individualism.

1. Ever greater competition in rendering of private medical services by individual physicians, insurance companies and hospitals.
   (a) May the best physicians, insurance companies and hospitals prosper.
   (b) No interference with incentives to individual growth of 170,000 + physicians, many private insurance companies, pharmaceutical firms, and private hospitals.
   (c) Ever increasing improvement in physicians' training and quality of practice as a result of the experienced and inspired control by physicians using phenomenally successful methods, i.e., by way of national, State, County and hospital medical groups or "Organized Medicine".
2. Continuation of the acceleration of improvement of medical care of the ill and the prevention of illness in the healthy.
3. Maintenance of independence and dignity of the people plus a free choice of the best and least expensive medical care.
4. "Liberty is from the people." They must be in a position to regulate government and control its power.

Treatment

Doctor, do not permit Democracy to destroy its most precious possession, controlled free enterprise in the practice of medicine. The November elections will probably determine the future of medicine in the United States.

Suggestions: (1) Correct the apathy and lack of information among your patients, friends and legislators; (2) Vote on the issues at stake; (3) Send your substantial check in the name of the party of your choice.

DFL State Control Committee Headquarters, 6 East Franklin Avenue, Minneapolis, Minnesota.

Minnesota Republican Finance Committee, Northwestern Bank Bldg., Minneapolis 2, Minn.

A.H.W.

Opinions pro and con concerning the November election are welcome.

CLINICAL DIAGNOSIS OF MITRAL INSUFFICIENCY

Renewed interest in the diagnosis of mitral insufficiency has been generated by the open heart surgeons who now include repair of this defect in their repertoire. Precise diagnosis has become crucially important. When a combined lesion of the mitral valve is suspected, the surgeon must know which is predominant. If he believes the dynamic defect is stenosis, he very likely will elect a closed procedure. Under the circumstances, if his intra-atrial examining finger encounters the significant jet of severe mitral insufficiency, he may be forced impotently to retreat since today repair of insufficiency demands visualization of the valve. Conversely, he cannot indiscriminately use open surgery when the chief lesion is stenosis, reparable by safer closed procedures.

Alone of the heart valves, the mitral must withstand the systolic pressure of the contracting left ventricle. The pressure to be contained requires a complicated system of supports for the frail valve surfaces. The two leaflets supported by the stays of the chordae bear a resemblance to a double sail rigging with the anterior (aortic) leaflet serving as the important mainsail.

Insufficiency may result from (1) a congenital defect typified by the split valve of atrio-ventricular canal; (2) infection, such as rheumatic, subacute bacterial and, perhaps, brucellosis; and (3) insufficiency due to miscellaneous causes. Great enlargement of the left ventricle disturbs the mitral valve by dislocating the papillary muscles and attached chordae tendinae. Rarely may a myocardial infarct rupture a papillary muscle, or trauma sever one or more chordae, producing extreme insufficiency. Increasing in importance is the iatrogenic mitral insufficiency following surgical relief of mitral stenosis.

There is little in the history of the patient to differentiate insufficiency from other forms of mitral disease. Weakness may be more prominent than dyspnea. The "mitral facies" with the thin, pinched features, blue lips, and lilac cheeks is a late and striking manifestation. Left ventricular enlargement characteristic of mitral insufficiency produces a heaving impulse displacing the apex laterally and downward. The murmur typically is loud, low pitched, pan-systolic, heard principally at the apex and transmitted to the axilla. The variations from the typical are numerous. The pitch can be low or high, occasionally "screaming," the "sea-gull" sound. A thrill may be present with the loudest, lowest pitched murmur. The location is variable, the murmur often being well heard along the left border of the sternum. Finally, the intensity may be diminished to the point where the systolic murmur is entirely inaudible. The usual association of mitral insufficiency with stenosis means that often presystolic and usually mid-diastolic murmurs can be found. The accentuated sound of mitral valve closing (loud M1) and the sound of valve opening (opening snap) may be heard in insufficiency when one leaflet, particularly, the posterior remains mobile. As in mitral stenosis, pulmonary hypertension appears and a loud P2 occurs. Atrial fibrillation is also common.

The electrocardiogram, with its predominant right strain pattern, is helpful in differentiating mitral stenosis. Mitral insufficiency has a less typical pattern with both right and left abnormality. The chest roentgenograms in various positions, with a barium-filled esophagus, will show enlargement of both ventricles, a large occasionally giant left atrium and calcification of the mitral valve. Prolonged arm-to-tongue circulation time here is largely a function of the increase in central blood volume. Right and left heart catheterization, with pressure studies and dye dilution curves, are helpful, though not as definitive as in mitral stenosis. Angiography is less valuable but may serve to differentiate the uncommon atrial myxoma.

The differential diagnosis must evaluate the systolic murmur. A murmur of no cardiac pathologic significance must first be ruled out. Such a murmur is usually less than grade III intensity, not heard throughout systole, often disappearing on exercise or with change of position. It is associated with no other evidence of heart disease. Concomitant fever, infection, hyperthyroidism, or anemia may suggest that turbulent flow with high cardiac output is the cause of a murmur not associated with valvular difficulties. In the presence of rheumatic fever, a systolic murmur at the apex must be considered to be mitral insufficiency until proven otherwise.

Patent ductus arteriosus with a systolic murmur, interventricular and interatrial defects are the congenital diseases most often confused with mitral insufficiency. Aortic stenosis, with its murmur occasionally heard at the apex, is a trap for the

unwary. Peripheral signs of aortic stenosis are helpful. Demonstration of aortic valve calcification by x-ray, particularly by cinefluorography with the image intensifier, is diagnostic.

The chief right-sided lesions to be differentiated are pulmonary stenosis and involvement of the tricuspid valve. Here the peripheral evidence of expansile liver and pulsating veins are of diagnostic consequence. An excellent recent review of mitral insufficiency can be found in "Symposium on Mitral Insufficiency," (Mayo Clinic Proceedings, 33:497-534, October, 1958).

Reuben Berman, M.D.

CLINICAL DIAGNOSIS OF MITRAL STENOSIS

In the early days of penicillin, the story was told of a hospital where patients, on admission, were put into a ward and treated with penicillin for three days. If they were still ill at the end of that time, they were examined to find out what was wrong with them. In the present-day popularity of the cardiopulmonary laboratory, with the right heart catheterization, left heart catheterization, Gorlin formulae, and dye-dilution curves, many doctors forget that the routine examination of the patient is still the most important method for making the diagnosis in rheumatic heart disease. Cardiac auscultation remains the single most important method of examination. This, combined with a good history and physical examination, roentgen studies, and an electrocardiogram still gives most of the answers. Much of the data obtained by laboratory procedures can be predicted from the clinical examination. This is not to minimize the importance of laboratory procedures, for it is through their use that our clinical acumen has been and is being extended so that we can anticipate what the laboratory procedures will show.

The characteristic apical, rumbling, middiastolic murmur is the mainstay in the diagnosis of mitral stenosis. If this murmur is moderately loud or prolonged, mitral stenosis is almost certainly present. If, at a regular rate of below 90, the middiastolic murmur ends with a presystolic murmur, there can be little question about the presence of mitral stenosis. Next of importance is the presence of an opening snap of the mitral valve. This, however, is not always present and is not necessary for the diagnosis. An accentuated first heart sound is usually associated with the opening snap. There are a few conditions where a rumbling, middiastolic murmur may be present without mitral stenosis. These can usually be separated from the mitral stenosis if they are considered: (1) In congenital heart anomalies associated with increased flow across the mitral and tricuspid valves, a rather short middiastolic murmur may occur. The associated findings in these cases usually give a clue to the diagnosis. (2) The murmur of tricuspid stenosis is similar to that of mitral stenosis but is closer to the sternum. Mitral stenosis is usually also present. (3) Patients with fairly marked aortic insufficiency, and occasionally patients with large left ventricles due to other causes, may have a middiastolic and even presystolic murmur. Here the associated findings again alert one to the diagnosis. (4) Marked mitral insufficiency may be associated with a middiastolic murmur. Recognition of this condition is most important and will be considered in a moment.

Having decided that mitral stenosis is present, the questions that must be answered are: How tight is the mitral stenosis, and how flexible is the valve? The following considerations will usually decide whether the stenosis is tight or not:

(1) Generally speaking, a loud murmur, or one of long duration, is almost certainly associated with a tight mitral stenosis. The intensity of the murmur should be judged at a normal heart rate and not after exercise. On the other hand, a tight mitral stenosis may be present without a loud murmur and at times with almost no murmur. When the stenosis is very marked, the murmur may actually be faint or inaudible because of the marked decrease in flow through the valve. (2) With a tight mitral stenosis the patient must have a definite decrease in ability to exert. Women will often say that they are not short of breath, but, on the other hand, will admit that for years they have been limiting their activity so that they do practically nothing. Men, on the other hand, are forced to make a living and will get into difficulty with valve openings which are much larger than those in women. The greater body size of the men also accounts for the fact that men have trouble with valves which women could easily get by on. (3) Left auricular enlargement,

From the Cardiopulmonary Department of General Rose Memorial Hospital.

as determined by x-ray and electrocardiogram, is an important clue to the tightness of the stenosis if, by auscultation, one can rule out an important degree of mitral insufficiency. (4) If auscultation does not show too much mitral insufficiency, an increased pulmonary artery pressure indicates a tight mitral stenosis. The pulmonary artery and wedge pressures that will be found on catheterization can be very closely predicted in these patients on the basis of the clinical findings. This is done by correlating several factors: the size of the pulmonary artery, the size of the left auricle, the intensity of the pulmonic second sound, and the evidence of right ventricular hypertrophy by x-ray and especially on the electrocardiogram.

The amount of scarring and deformity of the valve can be predicted with good accuracy by the following factors: (1) A sharp high-pitched first heart sound indicates a valve that is mobile. As the valve loses its mobility the sound becomes dull and is diminished in intensity. (2) The presence of an opening snap of the mitral valve also indicates a mobile valve. Although a valve may be mobile enough to produce a loud first sound and an opening snap, the valve may be quite thickened and leathery. (3) The older the patient the more likely the valve is to be thickened and have some calcium in spite of the presence of an opening snap and a loud first heart sound. (4) When there is an appreciable degree of mitral insufficiency as determined by auscultation, the valve is much more likely to be a poor one for operative intervention than when there is no mitral insufficiency. (5) The presence of very much calcium on the valve, as determined by fluoroscopy, is also likely to indicate a badly scarred valve.

How does one interpret the presence of the murmur of mitral insufficiency when it appears that a mitral stenosis is present? (1) When evidence for a tight mitral stenosis includes the presence of an opening snap of the mitral valve and a loud first sound, the murmur of mitral insufficiency is usually not of great importance and can be ignored, even when it is fairly loud. (2) When the presence of a tight mitral stenosis is indicated by a moderately loud or loud diastolic murmur, but there is a dull first heart sound and no opening snap of the mitral valve, then the murmur of mitral insufficiency indicates a scarred valve with a fixed opening. A murmur of mitral insufficiency in these circumstances may be loud, even when the valve opening is only one square centimeter in diameter. (3) When the murmur of mitral insufficiency is loud and associated with a third heart sound rather than an opening snap of the mitral valve, and when the middiastolic murmur is rather short, then the mitral insufficiency probably predominates and the stenosis is not of an important degree.

A last word regarding the patient whose primary clinical finding is that of a marked tricuspid insufficiency with a loud, high-pitched systolic murmur which is maximum between the apex and the left sternal border: The tricuspid insufficiency is often the end result of a tight mitral stenosis, and the evidence of the mitral stenosis may be only a faint, middiastolic murmur heard in the anterior or midaxillary line. Recognition of these patients is important, because surgery often gives dramatic results.

Abe Ravin
University of Colorado School of Medicine

"CANDY STRIPERS"

Some 150,000 teenagers are busy these days proving that adolescence is not necessarily a time of delinquency. They serve as volunteers in approximately 5,500 American hospitals.

Sometimes called junior aids, "volunteens," or "cartwheelers," they are usually known as "candy stripers." Their duties range from counting linen to feeding patients.

In addition to providing assistance in the hospital, the teenage program serves as a teaching procedure, according to Mrs. Palmer Gaillard, Jr., Mobile, Alabama, chairman of the American Hospital Association's Council on Hospital Auxiliaries and vice president of the board of trustees of the Mobile Infirmary.

It acts as a stimulant for recruitment into nursing and other health careers, and it helps teach future citizens about hospitals. "Out of teenage volunteers come adult volunteers and hospital board members," she said.

Teenage volunteers ideally are between the ages of sixteen and eighteen, although those as young as fourteen may serve with careful supervision. Both boys and girls work at such jobs as arranging flowers, supervising children's play, typing, waiting on tables, carrying messages, assisting in the library, preparing occupational and physical ther-

apy material, reading to patients, sorting mail, and acting as escorts.

Many of the hospital programs are arranged through school faculty advisors and vocational counsellors, placement directors of metropolitan volunteer bureaus, and leaders of scout troops, 4-H clubs and church groups. The teenagers are members of the organized volunteer department or service of the hospital, reporting to the person in charge of that department. All undergo initial training periods.

The importance of the teenage program was pointed up in 1958 when Governor Price Daniel of Texas commended the Candy Stripers of the Baptist Memorial Hospital, San Antonio. He said:

"In our justified concern over the rapid increase in juvenile crime . . ., we often overlook the good work being done quietly and effectively by American youth. . . . High on the list of such efforts is the commendable and constructive work of the 150 girls and boys, between the ages of fourteen and seventeen, comprising the Junior Auxiliary to the Baptist Memorial Hospital of San Antonio. . . ."

And a Boston teenager commented:

"As a junior volunteer I was able to get out of my own little world and meet a much broader world. I was able to feel needed and learned to accept many things. . . . I am grateful to have had this chance of serving others."

THE COUNTRY DOCTOR AND OUR PROSPEROUS FARMING COMMUNITIES

The time has come to bury the fake concept of the lovable, romantic picture of the country doctor rushing through hail, snow and sleet to deliver a baby by the light of a kerosene lamp, or still worse, to perform an emergency appendectomy on the kitchen table.

The modern doctor in our prosperous farming areas is more likely to work in a very modern, specially built clinic, with all of the necessary equipment that many city practitioners would envy. The old dingy office over the drug store is just as out of date as the horse and buggy. But the fake, even if romantic, concept still lingers on, and is causing our young men to overlook a wonderful satisfying field of practice—a field both professionally and monetarily satisfying.

It would be well to weigh the stress of competition, the maneuvering to get on a hospital staff with all the rules and restrictions put in his way—the traffic and parking irritations on one hand against the advantages on the part of a practice in the center of a prosperous farming community.

In the southern part of Minnesota we have a county about 25 miles by 35 miles and with a population of 25,000. This is served by seven active doctors. These figures alone will show that a newcomer would be welcomed by the doctors as well as the people. The community hospitals would welcome him with open arms and permit him to do anything that he can do properly.

Some towns have built modern doctors' offices, well equipped and offer them to the proper men at terms which cannot help but assure financial success. The towns are located on well-paved highways open the year around. There are good schools and churches for agreeable family living. The communities have become aware of the problems facing the doctors and are both willing and able to give him understanding support.

Why, then, is there such a shortage?

First and foremost, I believe we have not rid ourselves of the false concept of the country doctor mentioned above. But there is also a second drawback. This has been the effort of one man to carry the whole load on his shoulders. Modern practice requires laboratory and hospital facilities. The modern doctor requires and demands sufficient free time for family life, recreation and postgraduate work. This condition can be met only in a center large enough for two doctors working as partners.

Such offices (clinics if you will) can give around-the-clock service and still provide the doctor with the above-named private requirements. To do this, the partners must be equals, not senior and junior. If our young general practitioners would investigate the splendid opportunities offered, I am certain that many would find rich rewards in constructing a new country doctor image.

Hilmar R. Schmidt, M.D.

"While it is unlikely that the individual practitioner will see many cases of 'Jaguar chest' or 'Corvette hip.' the increasing popularity of smaller automobiles and the renaissance of the gearshift lever should be a warning to the clinician to be on the lookout for new musculoskeletal syndromes."—Jerome F. Strauss, Jr., M.D., J.A.M.A., May 28, 1960.

Public Health

ORAL POLIO VACCINE TRAITS IN MINNESOTA SUMMARIZED

The Minnesota Department of Health was first introduced to the Lederle-Cox strains of oral polio vaccine in 1957 when twenty-five infants (born to mothers immunized during pregnancy with two doses of Salk vaccine) ranging in age from four days to six months, were fed living attenuated poliomyelitis virus type I, type III, and type II at intervals varying from three to eleven weeks. Fourteen infants of less than two weeks in age were vaccinated against all three types of viruses. All demonstrated satisfactory antibody response at approximately two months of age.

When the orally vaccinated group was compared to a similar group of infants inoculated with Salk vaccine, the antibody response to the attenuated virus was found to be as good or better for types I and III, but poorer for type II. Evidence of spread to other members of the family, exclusive of the father, was determined by significant antibody rise or isolation of virus from the stool. Spread to siblings was 68 per cent for type I, 16 per cent for type II, and 60 per cent for type III. Illnesses attributable to the vaccine were not observed in the infants or members of their families.

Como Village

The next Minnesota study was conducted in Como Village, a crowded university housing development. A total of 551 persons (288 adults and 263 children), comprising 150 families, were given orally administered vaccine in capsules at three-week intervals in 1958.

The orally administered attenuated polio viruses used in the study were clearly effective as antigens for children. This effectiveness extended to all three types. When measured by a crude bettering of an original antibody titer of less than four, these viruses were effective in inducing such a change in approximately 85 to 90 per cent of the participants. The attenuated viruses used are like naturally occurring viruses in all respects, except that they do not produce clinical disease. Although the vaccine was less effective in adults, a trend was suggested in that the virus-fed group always had better conversion rates than the placebo-control group.

Grove East Village

While the monovalent capsules were being fed, Doctor Cox and his co-workers found it possible to pool the three types of attenuated poliovirus in a liquid form, thus making it possible to feed the three virus strains simultaneously in a single dose. Another study was undertaken in Grove East Village, a student housing development in St. Paul, to compare the effectiveness of the monovalent and trivalent vaccines.

Sixty-five families in Grove East Village participated—a total of 111 children and 108 adults. Half of the families received liquid monovalent vaccine at three-week intervals. The other half received two feedings of placebo followed by a third feeding of the liquid trivalent vaccine. The Grove East trials showed that the trivalent form did not act as effectively in producing antibodies and appeared especially weak for type II. The response in adults, as was the case in Como Village, was not as good as the response in children, although a definite trend toward positive responses was evident. The monovalent form used in these studies appears superior to the trivalent form in children, but there appears to be little choice when adults are involved. However, the trivalent vaccine seems to have enough efficiency and enough additional advantages to recommend it to the attention of workers in public health and preventive medicine.

St. Cloud Reformatory

A third study was conducted at the St. Cloud Reformatory in 1959. The objectives were to determine the effectiveness of trivalent vaccine to produce antibodies in relation to its ingestion before and after food; the effectiveness of feeding

trivalent vaccine in gelatin capsules (to bypass the pharynx), as compared to unencapsulated vaccine to produce antibodies; and the observation of pharyngeal recovery of poliovirus and occurrence of viremia.

The data evolved showed no significant difference in antibody response in the young male adults who participated, whether the vaccine was fed in liquid form or in gelatin capsules, or whether vaccine was fed before or after a meal. Pharyngeal infection occurred in a great majority of instances where the antibody titer was less than four for the virus type isolated. Viremia was detected only when the antibody titer was less than four for the virus type isolated. Virus was present in the pharynx in only two persons who swallowed the gelatin capsules, whereas virus was present in the pharynx in a large number of persons who drank the liquid vaccine. Viremia was detected in eight of ninety-five persons tested. None was ill at the time of viremia, and there were no illnesses reported which could be attributed to the vaccine in any of the participants.

1960 Field Trials

In 1960, Minnesota extended its study to include larger communities. These studies maintained the same standards as the smaller efforts. Every study was placebo controlled; every study was "double blind"; and surveillance arrangements were instituted. The feeding of 31,335 participants of all ages was completed on March 31 in Minneapolis. A total of 17,042 participants of all ages were fed in St. Paul, and feedings in Duluth numbered 21,700 persons of all ages. A study limited to preschool and school age children in Meeker, Kandiyohi, and Swift counties drew 16,000 registrants. Similar studies in Bloomington and St. Louis Park, Minneapolis suburbs, resulted in the feeding of 8,100 and 10,000 children, respectively. Thus, 104,288 persons received the oral vaccine (half getting a placebo). In all of the Minnesota studies, stool and blood specimens were collected at appropriate intervals. There have been no untoward effects or clinical illnesses which could be attributed to the vaccine.

AMERICAN HEALTH-CARE TEAM COMMUNICATIONS

Eugene N. Beesley, leading drug manufacturer, addressing the 1960 Michigan Clinical Institute, said that lack of understanding of the true facts of medicine and medical care "is casting doubt on the integrity of drug manufacturers, the efficacy of drugs, the ethics of the medical profession, and the quality of hospital treatment."

He said that the health-care team faces two big responsibilities. "To the extent that complaints and criticisms are justified, we must strive to make improvements.

"Our second responsibility must not be overlooked. The health-care team has done a better job in providing care for the sick than in telling its story to the public. We must do a better job at public relations.

Beesley said that drug prices are widely believed to be "high" or even "too high." "But too high in relation to what?" he asked. "Are the prices paid by consumers too high in relation to the benefits received? Have drug prices risen out of proportion to other commodity prices?

"There is certainly no evidence of an inordinate increase in retail drug prices. In fact, according to Dr. Jules Backman, professor of economics at New York University, Americans today would be paying a billion dollars a year more for drugs if the price of medicine had gone up as much as the total cost of living since 1939."

Total direct consumer expenditures for drugs increased from $1,466,000,000 in 1948 to $3,261,000,000 in 1958. Annual expenditures per capita increased from about $10 to about $19.

"But these increased expenditures for medicine do not necessarily reflect increased prices," he said. "They can and do reflect increased consumption. The principal reason for higher consumer expenditures for medicines is simply that more beneficial medicines are now available to the consumer than ever before in history.

"A second point of misunderstanding centers around average prescription price.

"This figure is derived simply by dividing the total dollars spent for prescriptions in a given year by the total number of prescriptions.

"On this basis, the consumer who paid $1.51 for the average prescription ten years ago will pay approximately $3.00 today.

"But this yardstick," he said, "is also virtually useless as a sound measurement for drug pricing performance, for it compares totally different things. The average prescription today involves products, processes, and benefits which did not exist in 1948.

"Comparing average prescription prices over a period of years is like comparing prices of a one-engine plane of thirty years ago with a Boeing 707 jet transport. You would hardly conclude that the price of a 707 jet is too high because it costs more than Lindbergh's *Spirit of St. Louis.*"

President's Letter

"LIFE THROUGH MEDICINE"

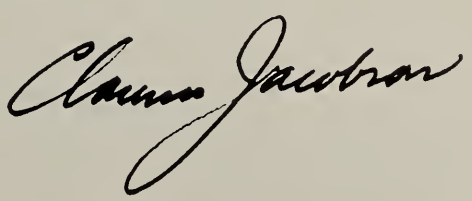
"Life through Medicine" was the theme adopted by the Council on Scientific Assembly for its 109th Annual Meeting at Miami Beach . . . a program dedicated to the student of medicine, the American physician, who in continuing his post-graduate medical education does so for the specific purpose of bringing to his patient the newer advances in medicine, thereby adding to the "two score and ten" of a short generation ago.

Approximately 9,000 physicians were in attendance together with an equal number of guests and auxiliary members, bringing the total close to twenty thousand. Preparing 290 scientific and 275 industrial exhibits represented a formidable task. The use of improved audiovisual means of presenting medical programs was utilized to the fullest. A complete course on body fluids was offered. The lectures, medical motion pictures and television programs were correlated to give complete coverage of the major problem diseases. The hundreds of participants were truly authors of this year's program which was in itself a textbook of medicine.

The 209-member House of Delegates, the policy-making body of the AMA, held its deliberations throughout the week in the Americana Hotel. The problems facing organized medicine today were reflected in the forty-six resolutions presented together with the nineteen referrals for supplementary reports of the Board of Trustees.

I refer you to the June issue of Minnesota Medicine news page, in which Mr. Brunn has summarized the proceedings setting forth the AMA's statement on the health care for the aged. In addition, the Board of Trustees was urged "to initiate a non-partisan open assembly to which all representative groups are invited for the purpose of developing the specifics for a sound approach to the health service and facilities needed by the aged, and that thereafter the American Medical Association present its findings and positive principles to the people." Also that "the AMA increase its educational program regarding employment of those over sixty-five; emphasizing voluntary, gradual, and individualized retirement, thereby giving these individuals not only the right to work but the right to live in a free society with dignity and pride."

Returning from the annual convention leaves one with a feeling of a rewarding experience. Witnessing the portrayal of scientific advancements and utilization of allied professions in the advancement of medical progress cannot help but fill the practicing physician with wonder and pride—wonder at the fact of accomplishments and pride knowing that all this is available to his patients. This situation is not duplicated elsewhere in the world today. Our endeavors to maintain these high standards continue in the halls of Congress to keep our profession free. Continued sustained effort will always be our heritage.



President, Minnesota State Medical Association

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

MINNESOTA PHYSICIANS URGED TO REPORT PROMOTERS OF ILL-ADVISED HOSPITAL PLANNING

Increased concern has been expressed by a number of Minnesota physicians with the critical problem of the ill-advised hospital planning in some small communities as well as in the suburban areas adjacent to the large metropolitan and urban centers in Minnesota. It has been reported that certain individuals with special interests in the promotion of hospitals, through the medium of fund raising and other devices, have approached suburban and rural communities encouraging the construction of small hospitals where previous surveys appear to indicate that the area is not of sufficient size to justify the construction and operation of such hospitals. In addition, others have proposed small facilities to provide a few beds for a limited maternity service and minimum medical services.

This can only result in a lowering of the quality of services in this as well as in adjacent hospitals, since occupancy rates in all surrounding hospitals usually decline when new beds are placed in operation elsewhere. The argument is frequently used that the costs in such small institutions are less than in a larger and more complete general hospital, whereas actually the services rendered are considerably below what is accepted today as complete and adequate hospital care.

Promoters Lack Qualifications

The Council of the Minnesota State Medical Association, on February 24, 1957, on the advice of its Maternal Mortality Committee, warned against the development of such limited hospital services and the associated potential increase in mortality. At the same meeting, the Council also endorsed the action of the State Board of Health relative to its refusal to license new structures as hospitals unless reasonable compliance is made with respect to both the quality of services and the extent and scope of the physical facilities to be provided.

The Minnesota State Medical and Minnesota Hospital Associations, as well as the American Medical and Hospital Associations, have constantly emphasized the importance of quality services and facilities in hospitals through compliance with the standards established by the Joint Commission on Accreditation of Hospitals.

Good Hospital Care Includes Many Factors

Hospital care today means the provision of trained and experienced personnel for services in administration, nursing, laboratory, x-ray, anesthesia, dietetics, medical records, physical and occupational therapy and other specialized services. The functions of the business office as well as the service departments, including the power plant, laundry, housekeeping and maintenance must be in capable hands if the hospital is to function properly and be administered economically. Small hospitals constructed without an adequate population base for continued support can only result in an unnecessary duplication of facilities and services in the area. Such small hospitals are too expensive, both in construction and operating costs to be justified, and adequate staffing of their services is next to impossible. The supply of trained personnel in the health field is extremely critical. Although there is a widespread interest developing in the recruitment of young people for careers in the health field, it will be many years before adequate numbers will be available to supply the demands. *A hospital is only as good as the quality of the personnel on its staff.* Adequate hospital services will not be provided unless hospitals are large enough to support both facilities and personnel.

Hospital Planning Requires Realistic Approach

Realistic hospital planning, therefore, means a careful study of the community and its surrounding trade area, including all adjacent hospital areas. sublimation of personal and community pride, a realization that the necessity for traveling a reasonable distance is of minor importance as compared to securing good hospital services to the end that there is provided an orderly pattern of care facilities of high quality. Any other action will result in economic waste in capital investment as well as in operation, a lowering of standards of care and

an inevitable loss of public confidence in the adequacy and quality of services provided in hospitals throughout the community, the state and the nation.

Association members who have reason to believe that, within the geographic area of their professional activities, a hospital is being planned, or promoted, that has not been discussed with qualified hospital authorities, are urged to bring this matter to the prompt attention of the Minnesota Department of Health, Division of Hospital Services, University Campus, Minneapolis 14, Minnesota.

Such action may help to avoid unnecessary and wasteful expenditures of much time and a great deal of money.

PROFILE OF A DOCTOR'S OFFICE IS GIVEN

Eight per cent of the physicians in the United States maintain more than one office. In population areas of more than 500,000 persons, 14.8 per cent of the doctors had more than one office; 6.3 per cent of doctors in cities in the ten to fifty thousand population range. In cities under 10,000 population, the number of doctors who maintained more than one office was estimated to be 6.9 per cent.

Specialists Most Likely to Have More Than One Office

Full time medical specialists more frequently than part time specialists or general practitioners have been found to maintain more than one office. For full time specialists the figure is twelve per cent, part time specialists, five per cent, and general practitioners 4.5 per cent.

Location of Doctors' Offices

Most doctors' offices are still located in downtown business districts. The estimated number is 39.5 per cent. For medical practices located in residential neighborhoods, the total is 25.4 per cent; shopping centers, 4.8 per cent; neighborhood business districts, twenty-four per cent and 6.3 per cent in all other localities.

Shopping Center Medical Practices Grow

According to a survey conducted by *New Medical Materia,* the number of physicians in shopping centers has jumped 153 per cent in three years. In 1958, the estimated total was 2,981; in 1959, the total increased to 4,025 and by 1960, the number rose to 7,536 or an estimated increase from 1959 to 1960 of 87 per cent.

Where Do Doctors Keep Their Offices?

Professional office buildings are used by 40.6 per cent of the physicians to house their practice; 10.7 per cent use group clinic buildings; 2.9 per cent hospitals; 8.6 per cent apartment buildings away from their residence; 17.1 per cent commercial office buildings; 18.0 per cent in their own homes and 2.1 per cent all other.

Pattern of the Doctor's Office

The average doctor's waiting room has seats for twelve patients. Only 4.2 per cent have no examination room; 20.5 per cent have one examination room; 32.3 per cent have two; 20.3 per cent have three; and 22.7 per cent have four or more examination rooms.

Washrooms

One washroom is the average for 61.5 per cent of the nation's doctors offices. Only 11.2 per cent have no washroom; 19.8 per cent have two; 4.8 per cent have three and 2.7 per cent have four or more washrooms.

Expansion Plans

It has been estimated that in 1960, 17.2 per cent or every sixth physician will improve his office space. Nine per cent will enlarge present space and 8.2 per cent will open a new office.

MEDICAL FEES SHOW UPWARD TREND

The national average for general practitioners fees in March, 1960, was $3.96 per office visit. This represents an increase of eighteen cents over the June, 1958, average of $3.78 per office visit.

House Calls

An average increase of 34 cents per physician's house call was noted since June, 1958. According to statistics prepared by the U. S. Bureau of Labor Statistics, in June, 1958, the average charge for a house call was $6.12. In March, 1960, it was $6.46.

Surgeons' Fees

During the same period, the national average fee for a tonsillectomy increased from $69.63 to $75.21. For an appendectomy, the average increase was $5.62. In June, 1958, the average fee for this procedure was $160.37 and in March, 1960, $165.99.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

DOCTOR, YOU ARE ALSO A CITIZEN

The Art of Medicine also includes the art of good citizenship. Physicians, as citizens, also have certain responsibilities toward the local community, the state, and the nation.

This is an election year. Americans will elect a President and Vice President; thirty-four Senators, also numerous Representatives, Governors and other state and local officials. Minnesota physicians, as citizens and members of the medical profession, have an important responsibility to help decide who these leaders will be.

To accomplish this, physicians must function as individuals through their county medical societies and the Minnesota State Medical Association. Individual members of the medical profession are encouraged to increase their active role as members of independent political action groups.

Basic Citizenship Responsibilities Given

The American Medical Association Field Service Division, which serves as a liaison between medical societies and the AMA, recommends the following seven "basics" of citizenship for the physician who wishes to take his civic responsibility seriously:

—The doctor's primary duty as a citizen is to be the guide and source of authority in all health matters relating to his community. This is an all-year-round civic responsibility, which his training and experience have qualified him to handle better than any other person in the community.

—The doctor should openly identify with the party of his choice, and vote regularly at all elections.

—The doctor should make an investment in democracy by contributing financially to the party of his choice.

—The doctor should encourage patients and others with whom he comes in contact to register and vote in all elections.

—The doctor should keep informed on candidates and issues and let others know where he stands politically.

—The doctor can help candidates of his choice by such means as displaying campaign literature in his waiting room.

—The doctor should devote as much time as his professional duties permit to work for good government and for the political party of his choice.

Medical Society Positions Defined

It is important to remember that as a corporate body, the medical society is seriously restricted by Federal law from direct political actions in elections and is prohibited from soliciting or contributing funds to any candidate or party in a federal election. However, a society is free to make its general political beliefs known to the public; to sponsor get-out-the-vote campaigns among its own members and the public; and to inform its members and the public on issues and candidates via such means as "know your candidates" meetings and distributing literature on candidates' voting records and views.

New Techniques Required

Medical societies interested in developing or supplementing better citizenship programs may benefit by observing programs which other organizations, such as the American Farm Bureau Federation, Kiwanis International, The American Heritage Foundation and the National Chamber of Commerce, have developed in the area of citizenship programs.

Citizenship programs which have proven successful, particularly in this an election year, include the National Chamber's Action Course in Practical Politics, Kiwanis International's Ballot Battalion and "CQ" program, and the American Heritage Foundation's "Register, Inform Yourself and Vote" program.

In numbers there is strength and much can be accomplished when a medical society joins forces with other community professional groups to explore a problem of national proportions. This is democracy at work seeking solutions to its own problems—these are groups of individuals using their trained talents in the service of the democratic values they cherish. More than ever before, our nation needs the trained minds of its professional people, no matter what their fields of excellence, to aid in discovering and applying solutions to the complex problems facing our rapidly changing society today.

Political Action Spurred by MD Training in Politics

Throughout the nation, increasing numbers of physicians have increased their effectiveness as workers for better government because they have been trained for their jobs.

Recommended as excellent training for this important job is the National Chamber of Commerce course in Practical Politics sponsored by local Chambers.

Frequently the formation of physician political action groups or committees has resulted in effective local action.

Normally these committees will function by concentrating their efforts in two directions: obtaining voluntary campaign contributions and conducting person-to-person publicity campaigns among friends, patients, relatives and other persons with whom they come in contact. Their message is what their congressman stands for and why he should be re-elected. In addition, the committee often invites members of the dental profession, insurance companies in the area as well as other doctors in the area to lend their support to the campaign.

Action Program Easy to Organize

The National Chamber of Commerce action program requires no political experience to organize and can be fitted into any society's program of activities. The National Chamber makes available all the necessary work materials for the course, including a discussion leader's manual which explains how to organize and conduct the nine workshop sessions on a weekly basis and contains a complete blueprint for the course. Course participants are provided with a set of eight pamphlets, each dealing with one important aspect of politics, such as: the individual in politics, political party organization, the political precinct, the political campaign, the political leader's problems. Participants also work on a series of case problems common to every community.

Individual physicians or medical societies interested in sponsoring this course in their community may write: Business Relations Department, Chamber of Commerce of the United States, 1615 H Street N.W., Washington 6, D. C.

For the graduate of the practical politics course or anyone interested in becoming active in politics, the Chamber has also developed an excellent "Checklist of Public Affairs and Legislative Opportunities" which lists a variety of ways in which the individual or organization may contribute to better government on every level.

Physician Good Government Action Vital

No longer can members of the medical profession regard politics and politicians as a necessary evil to be tolerated but kept at a safe distance from their daily round of activities. As medicine's future has been increasingly affected by legislative action and political decisions—as has every other sector of American life—physicians have been awakening to a long-felt need—to actively enter into political activities.

AMA's past president, Doctor Louis Orr expressed this new emphasis on political action: "A physician cannot, if he values this nation's high standard of medical care, divert his gaze from the social, economic and political issues which affect the practice of medicine." Said Dr. Orr, physicians have a duty to enter the political arena and present their case to the court of last resort, the American public.

Here's What Action Groups Can Do

Physician action groups can:

—Work to defeat Forand-type legislation and help to clarify public thinking on the whole issue of free enterprise vs. socialism as opposing systems by providing informed speakers to local organizations.

—Concentrate their efforts in an area in which they believe the physician can speak with authority—the health care problems of the aged; and find what the extent of the problem is locally in order to provide valuable information for the forthcoming White House Conference On Aging.

—Inform the public on social security legislation and its implications by distributing appropriate materials on this subject.

—Encourage the best possible candidates from both parties to run for public office and assist in their election.

—Encourage doctors at the local level to work for and actively support candidates of their choice.

—Solicit voluntary contributions to carry out these programs.

Good Government Action in Minnesota

When election day comes, Minnesotans will help to elect, in addition to a President and Vice President, a Governor and other State Officers, one United States Senator, nine Representatives and other local officers. President Eisenhower has said that in a democracy "politics ought to be the part time profession of every citizen." It is important that we remind ourselves that when people fail or refuse to exercise their responsibilities as citizens, government or other political groups will assume these responsibilities. Doctor, your professional life may well depend on how seriously you accept the challenge to exercise your rights as a citizen.

James A. Blake, M.D.
Chairman, Statewide Congressional (National Legislative) Committee

The Art of Medicine
also includes
The Art of Good Citizenship



"Sometimes, when I have a running nose, I'd like to clear it with TRIAMINIC®— just to check out that systemic absorption business.

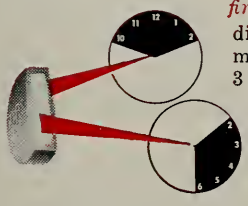
Reaches all nasal and paranasal membranes, huh?"

...and for humans with RUNNING NOSES...

You can't reach the entire nasal and paranasal mucosa by putting medication in a man's nostrils — any more than you could by trying to pour it down an elephant's trunk. TRIAMINIC, by contrast, reaches *all* respiratory membranes *systemically* to provide more effective, longer-lasting relief. And TRIAMINIC avoids topical medication hazards such as ciliary inhibition, rebound congestion, and "nose drop addiction."

Indications: nasal and paranasal congestion, sinusitis, postnasal drip, upper respiratory allergy.

Relief is prompt and prolonged because of this special timed-release action:



first— the outer layer dissolves within minutes to produce 3 to 4 hours of relief

then— the core disintegrates to give 3 to 4 *more* hours of relief

Each Triaminic timed-release Tablet provides:

Phenylpropanolamine HCl	50 mg.
Pheniramine maleate	25 mg.
Pyrilamine maleate	25 mg.

Dosage: 1 tablet in the morning, midafternoon and at bedtime. In postnasal drip, 1 tablet at bedtime is usually sufficient.

Each timed-release Triaminic Juvelet® provides:
½ the formulation of the Triaminic Tablet.
Dosage: 1 Juvelet in the morning, midafternoon and at bedtime.

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¼ the formulation of the Triaminic Tablet.
Dosage (to be administered every 3 or 4 hours):
Adults — 1 or 2 tsp.; *Children 6 to 12* — 1 tsp.;
Children 1 to 6 — ½ tsp.; *Children under 1* — ¼ tsp.

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timed-release tablets, juvelets, and syrup

STOP *running noses* *and open stuffed noses orally*

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Minnesota Blue Shield

Since Congress approved the Federal Employees Health Benefits Act last September, more than 55 per cent of the estimated 1,695,000 Federal workers who selected health benefits coverage from among the thirty-eight different programs chose Blue Shield as their medical care plan.

Under this act, Federal employees have the option of participating if they wish and are free to choose the health plans they prefer. The Federal government, as the employer, shares in the cost of this group coverage.

The preference for Blue Shield as the medical care plan was "an overwhelming vote of confidence in these community-oriented organizations," according to a spokesman for the National Association of Blue Shield Plans.

The Blue Shield spokesman noted that a breakdown of enrollment totals showed that government employees chose the high level-higher cost benefit program in preference to the low benefit-lower cost option, in a ratio of about four to one.

The high level benefit programs offered by other organizations were similarly preferred to the low cost-low level coverage. The Blue Shield spokesman said this indicated people were prepared to pay the additional price for broader forms of protection.

The choice exercised by Federal employees in selecting health benefit programs is especially significant because it represents the first time the element of free choice involving such a variety of programs has been exercised by so many individuals at one time.

"Neither group enrollment in industry nor individual enrollment campaigns on a community basis," the Blue Shield spokesman said, "can be compared with the Federal employee enrollment, and that is why the 'vote of confidence' for Blue Shield by these workers stand as remarkable evidence of the confidence the public has in Blue Shield organizations."

Minnesota Blue Shield will process claims for services rendered by Minnesota doctors to Federal employees covered by this nationwide plan.

In Minnesota approximately 15,000 Federal employees have enrolled in the Blue Shield plan. The rapid assimilation of so large a group presents a difficult administrative problem. The assignment of individual numbers, preparation of identification cards, and the various other administrative functions required for this processing will take some time. It is possible, therefore, that during the next few weeks, Federal employees may seek (and be entitled to) your professional services under this plan even though they have not yet received Blue Shield identification cards.

In order to facilitate the prompt payment of claims in this event, participating physicians are asked to submit the following information to Blue Shield headquarters:

1. The full name of the patient.
2. The specific office, department, and federal agency of his employment and the address.
3. The type of coverage (whether the patient is enrolled under the high or low option of the Blue Shield Federal group plan. The high and low options are comparable to Plan A and Plan B of the conventional group contracts.)
4. A brief description of the service rendered.

All new subscribers to the Federal group plan will soon have received their identification cards, and the inconvenience of operating without them will be a temporary one. The Blue Shield organization, meanwhile, will appreciate the cooperation of participating physicians in processing these claims in the above manner.

* * *

Minnesota Blue Shield is now sponsoring the radio series, "Doctor's House Call," featuring Dr. James Rogers Fox, on WCCO Radio, Minneapolis.

Doctor Fox, representing the Minnesota State Medical Association, has a large and loyal listening audience. His Monday-through-Friday programs are recognized as a significant contribution to public health education in Minnesota.

The five-minute programs are heard twice each evening, at 6:30 p.m. and 8:55 p.m.

* * *

Minnesota Blue Shield participating doctors as well as pharmacists throughout the state are lending valuable support to the Blue Shield program by displaying application folders for Blue Shield non-group contracts.

Coverage of non-group subscribers is an important aspect of the Blue Shield program and doctors and pharmacists, by making the application folders conveniently available, are helping to expand this coverage.

The Blue Shield organization urges both doctors and pharmacists to continue their support, which can do much to strengthen the position of voluntary medical care coverage in their areas.



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Hydroflumethiazide • Reserpine • Protoveratrine A

An integrated multi-therapeutic antihypertensive, that combines in balanced proportions three clinically proven antihypertensives.

In each **SALUTENSIN** Tablet:

Saluron® (hydroflumethiazide)—
a saluretic-antihypertensive ..... 50 mg.

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Comprehensive information on dosage and precautions in official package circular or available on request.

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For fast, complete treatment of vaginal infections

Problem is: she'll wait until discomfort is acute and then expect immediate relief. The answer is Trisert. Trisert preparations contain ALLANTOIN, an effective debriding agent which quickly dissolves heavy mucus often accompanying vaginal infections . . . METHYLBENZETHONIUM CHLORIDE, a quaternary germicide which removes unpleasant odors . . . SUCCINIC ACID, an aid in maintaining optimal vaginal pH . . . 9-AMINOACRIDINE HYDROCHLORIDE which has been included to supplement the bactericidal and trichomonacidal activity of other constituents. Treatment with Trisert Powder will control symptoms fast . . . usually within an hour . . . and provide effective initial treatment for 48 hours. After a second insufflation, the treatment is completed with at home use of Trisert Tablets which will generally bring the infection under complete control within 7 days.



Trisert

TRISERT TABLETS—Patient set, contains bottle of 30 tablets and special inserter. Bulk bottle of 100 tablets.

TRISERT POWDER—Available in 4 gr. individual treatment bottles. 12 to carton.

TRISERT POWDER INSUFFLATOR—Designed for use with Trisert Powder. Its use is urged for maximum efficiency.

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Medical-Legal

DETROIT (MICHIGAN) EX-CONVICT POSING AS PHYSICIAN CONVICTED ON NARCOTIC CHARGE

On June 6, 1960 Arthur Jangochian, thirty-four, 13160 Greenlawn, Detroit, Michigan, was sentenced by the Hon. Irving R. Brand, Judge of the District Court of Hennepin County, to a term of ten years at hard labor in the State Prison at Stillwater, having been convicted of the crime of unlawfully having possession of a narcotic drug. On April 29, 1960 the defendant had entered a plea of guilty to an information charging him with that offense. However, after sentencing the defendant Judge Brand stayed the execution of the sentence on condition that the defendant remain outside of the State of Minnesota. Immediately before being sentenced by Judge Brand, Jangochian had pleaded guilty to a charge of having two prior convictions for felonies.

The defendant was arrested in Minneapolis on April 25, 1960, when he appeared at the Richter Rexall Pharmacy, 427 Cedar Avenue, to purchase twenty-four 1/16 gr. tablets of dilaudid, claiming that he was the son of a cancer patient for whom a Minneapolis doctor had prescribed the drug. A short time before Jangochian entered the drug store, he had placed a telephone call there stating he was a Minneapolis physician, giving his name, and ordering the dilaudid for a "patient" who allegedly lived at an address on 19th Avenue South. The suspicions of the pharmacist were confirmed when he called the physician whose name the defendant had given and learned that no medication of any kind had been prescribed for the patient in question.

In a signed typewritten statement, the defendant admitted that he had arrived in Minneapolis from Detroit on the day before his arrest in order to visit a woman who worked in a Minneapolis night club and that he had made the telephone call to the drug store from her apartment. He also admitted that he was the owner of a small quantity of marihuana which was found in her apartment but he denied that the woman used narcotic drugs. Jangochian, who gave his occupation as a musician and a drummer, admitted to Judge Brand in court that he had been convicted as follows for unlawfully possessing narcotic drugs, both convictions being in Wayne County, Michigan, for violating state drug laws: May 20, 1953—sentenced to a one to four-year term at the State Prison at Jackson, Michigan; July 17, 1958—sentenced to serve a two to four-year term in the same institution. The defendant also admitted at the time of his arrest in Minneapolis that he was out of prison on parole.

PROFESSIONAL EDUCATION SEMINARS

The first in a series of Professional Education Seminars for physicians, dentists and nurses in Minnesota will be offered at Mankato this fall. The seminars will begin on Tuesday evening, October 18, and will meet for six consecutive Tuesdays through November 22, with classes running from 7:30 to 9:30. Meetings will be held at St. Joseph's Hospital in Mankato.

Communications

NEW UNIVERSITY OUT-PATIENT CLINIC APPOINTMENT SYSTEM

For many years, the University Out-Patient Clinics have accepted new patients for examination any weekday without advance scheduling. This policy has been followed on the assumption that better service could be provided by leaving the clinic doors "open," as it were, and being completely available and accessible at all times for referral. At times this has had the opposite effect and has resulted in disagreeable and expensive delays. It now seems clear that better patient care can be provided, and the needs of all concerned better served, if we schedule initial examinations.

Therefore, in contrast to our previous policy we are now sending patients specific advance appointments for examination. *This will not mean a wait or delay for appointments.* However, unless you indicate that it is desirable that the patient be seen immediately, he will be given a minimum of one week notice of his appointment to arrange for his clinic visit. (Patients who come without appointments will be seen, but obviously patients with advance appointments will be given preference.) Of course, patients with urgent or emergent medical problems will be seen without delay whether or not they have advance appointments. Indication of this on the medical referral or a phone call to Mr. Glenn Mitchell, the Director of Admissions, will expedite the patient's care in such cases.

As heretofore, *county patients* will be referred by their physician through their County Welfare Boards. As soon as the medical referral and County Papers for a new patient are received, the Director of Admissions will mail an appointment for a definite date and time to the patient. The referring physician and the County Welfare Department will both be notified of the patient's appointment date.

Part-pay, or *per diem patients,* which the physician refers here directly, should be scheduled for examination by writing or calling Mr. Mitchell, Director of Admissions. As soon as the medical referral is received an appointment will be mailed directly to the patient with a copy going to the referring physician.

Policies concerning private patients remain unchanged. Appointments for such patients are by direct referral by the patient's private physician to the individual staff physician or department.

The University clinic has always provided primarily a consultative kind of service for the patient and his physician (and at times the community). There will be no change in this function except that we expect to improve communication with referring doctors and speed the return of reports.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL



This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

NEW REGULATIONS OF FOOD AND DRUG ADMINISTRATION

Stronger regulations to insure that physicians receive adequate information about the drugs they prescribe and to insure the safety of new drugs were proposed by the Food and Drug Administration.

The new regulations would:

1. Require sweeping changes in the labeling of prescription drugs. Virtually all prescription drug packages and printed matter distributed to physicians to promote sale of a drug would be required to bear complete information for professional use of the drug, including information about any hazards, side effects or necessary precautions.

FDA said that heretofore such fully detailed information has not been required in labeling when it was available in scientific literature, or, in certain cases, was available to the physician upon request. The only exception in the proposed regulations would apply to frequently used medicines that are commonly familiar to the doctor.

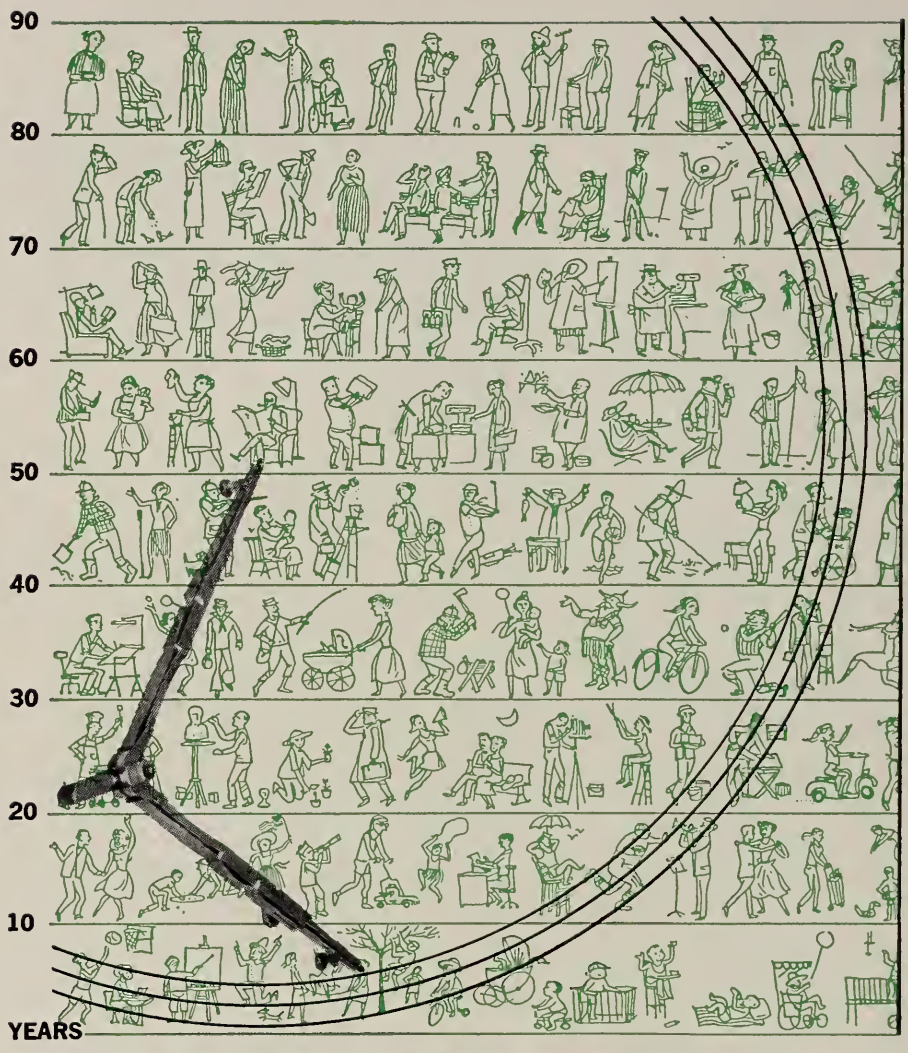
2. Provide that when safety requires, a new drug would be kept off the market until the manufacturer's representations regarding the reliability of manufacturing methods, facilities and controls have been confirmed by a factory inspection by the Food and Drug Administration.

Such an inspection would verify that the firm can insure the identity, strength, quality and purity of each batch of the drug, FDA said. Occasional inspections have shown conditions in manufacturing plants which were contrary to representations made by the manufacturer in his request for safety clearance.

Other proposed labeling changes would require drugs for injection and for use in the eyes to bear a quantitative declaration of all inactive ingredients. Labels of all prescription drugs would be required to include an "identifying lot or control number from which it is possible to determine the complete manufacturing history of the drug." Exemptions are permitted where there is insufficient label space provided the information is given on other parts of the drug package. All labeling bearing information for use of a drug would be required to have the date of its issuance.

FDA said the proposed labeling changes would correct a tendency on the part of some manufacturers to describe to physicians the merits of a drug without giving information regarding its hazards and the special precautions necessary for maximum safety and effectiveness.

(Continued on Page A-59)



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Supplied: Tiny 10 mg., 25 mg., and 100 mg. tablets, bottles of 100. Syrup, pint bottles. Parenteral Solution: 25 mg./cc. in 10 cc. multiple-dose vials; 50 mg./cc. in 2 cc. ampules. Prescription only.

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(Continued from Page A-57)

Commenting on the proposed regulations, George P. Larrick, Commissioner of Food and Drugs, said:

"The large number of new medications has made it increasingly difficult for doctors and pharmacists to keep adequately informed about them. We are hopeful that the proposed regulations will improve the communication of vitally necessary information and bring about a general improvement in drug promotion practices. At the same time, they should furnish a basis for more effective government control where necessary."

Interested persons are invited to submit written comments on the proposed regulations to the Hearing Clerk, Department of Health, Education and Welfare, Room 5440, 330 Independence Ave., S. W., Washington 25, D. C., within 60 days from the date of publication in the Federal Register.

* * *

NOTE TO CORRESPONDENTS: The proposed regulations discussed above are published in the July 22, 1960, *Federal Register.*

PHARMACEUTICAL RESEARCH

The prescription drug industry reports it spent $197 million on research and development last year in the biggest privately financed assault on ill health in history.

The expenditure—16 per cent higher than in 1958—amounted to 7.8 per cent of the companies' pharmaceutical sales of more than $2.5 billion.

Dr. Austin Smith, president of the nationwide trade association of 140 ethical drug firms, hailed the expenditure as "a typically American example of the force of private enterprise at work for the betterment of humanity." The third annual survey of research activities of the industry in co-operation with the National Institutes of Heath disclosed, among other facts:

- Drug industry research spending in 1959 was $7 million more than the companies estimated a year ago that it would be.
- Over $18 million of the total was spent outside of pharmaceutical house laboratories in the form of grants and contracts to medical schools, hospitals, research institutes and other institutions.
- An estimated 100,200 chemicals, compounds and other substances were prepared, obtained and biologically tested by the industry in 1959 in its search for new and more specific medicinals.
- Of these substances, 36,600 were in the field of cancer chemotherapy. The second heaviest concentration was 28,200 substances pertaining to allergies and infectious diseases.
- The 140 producer members of the Pharmaceutical Manufacturers Association, responsible for more than 95 per cent of ethical drug production in the United States, estimate research and development spending of $214 million in 1960.

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TUCKS may also be sent home with patient for continuation of care.

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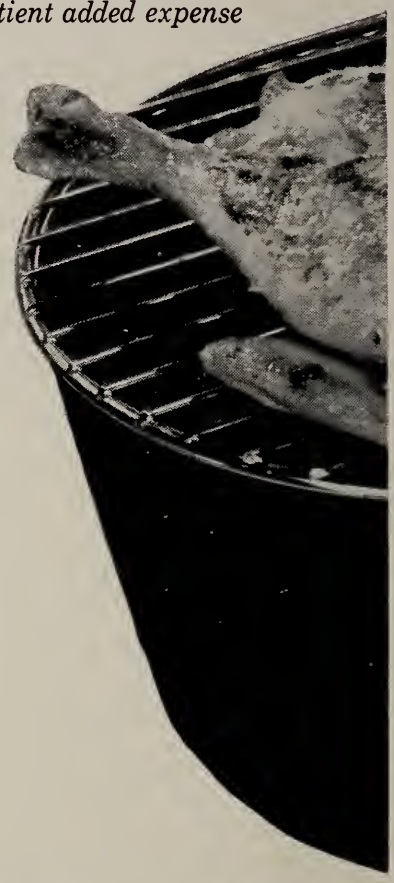
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Q. *When you want to reduce serum cholesterol and maintain it at a low level, is medication more realistic than dietary modifications?*

A. *Maintenance of lowered cholesterol concentration in the blood is a life-long problem. It is usually preferable, therefore, to try to obtain the desired results through simple dietary modification. This spares the patient added expense and permits him meals he will relish.*

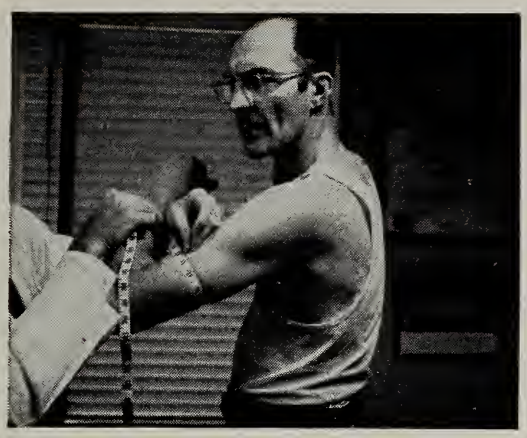


The modification is based on a diet to maintain optimum weight plus a judicious substitution of the poly-unsaturated oils for the saturated fats. One very simple part of the change is to cook the selected foods with poly-unsaturated Wesson. In the prescribed diet, this switch in type of fat will help to lower blood serum cholesterol and help maintain it at low levels. The use of Wesson permits a diet planned around many favorite and popular foods. Thus the patient finds it a pleasant, easy matter to adhere to the prescribed course.

Where a vegetable (salad) oil is medically recommended for a cholesterol depressant regimen, Wesson is unsurpassed by any readily available brand.

Uniformity you can depend on. Wesson has a poly-unsaturated content better than 50% . Only the lightest cottonseed oils of highest iodine number are selected for Wesson. No significant variations are permitted in the 22 exacting specifications required before bottling.

Wesson satisfies the most exacting appetites. To be effective, a diet must be *eaten* by the patient. The majority of housewives prefer Wesson particularly by the criteria of odor, flavor (blandness) and lightness of color. (Substantiated by sales leadership for 59 years and reconfirmed by recent tests against the next leading brand with brand identification removed, among a national probability sample.)



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In Memoriam

JOE W. BAIRD

Dr. Joe W. Baird, Minneapolis, died July 19, 1960. He was fifty-five years of age at the time of his death.

Doctor Baird specialized in Anesthesiology and received his medical education at the University of Nebraska College of Medicine, Omaha, in 1930.

His internship was served at the University Hospital in Columbus, Ohio. His postgraduate work included two years at Hartford, Connecticut, Hospital. From 1931 to 1940, he practiced medicine in Arcadia, Nebraska.

He was clinical associate professor of anesthesiology at the University of Minnesota, Director of Anesthesiology at Abbott Hospital, Past President of the Minneapolis Academy of Medicine and of the Minnesota Society of Anesthesiology, and was a member of the American Society of Anesthesiology, Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, Ruth; one daughter; his mother, and two sisters.

JOHN SPENCER HAMLON

Dr. John Spencer Hamlon, Fergus Falls, died July 18, 1960. He was fifty years of age.

Doctor Hamlon was born in Lamberton, Minnesota, and received his preliminary education at John Marshall High School in Minneapolis and the University of Minnesota. He graduated from the University of Minnesota Medical School in 1935 and served his internship at Swedish Hospital in Minneapolis.

He was on the staff of the State Hospital in Fergus Falls, where he worked with patients in the receiving department.

Doctor Hamlon was a member of the Park Region Medical Society, the Minnesota State Medical Association and the American Medical Association.

Survivors include his wife, two children and his mother.

JAMES T. LARSON

Dr. James T. Larson, medical doctor for the Swift Company, died September 9, 1960. He was fifty-six years of age.

Doctor Larson was born in Hartland, North Dakota, in 1904. He received his preliminary education from Donnybrook, North Dakota, High School and Grinnell College, Grinnell, Iowa. He was graduated from the University of Minnesota Medical School in 1929. He served his internship at Minneapolis General Hospital.

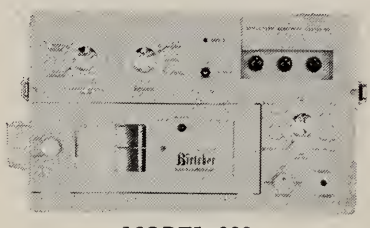
He was a member of Masonic Lodge No. 262 A.F.& A.M., Lake Wilson, Minnesota; Triune Chapter, Royal Arch, Pipestone, Minnesota, Ramsey County Medical Society, Minnesota State Medical Association, and the American Medical Association. He was a past master of the Masonic Lodge at Lake Wilson.

Doctor Larson is survived by his wife, his mother, two daughters, three sons, five sisters, two brothers and two grandchildren.

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Woman's Auxiliary

SCHOOL OF INSTRUCTION HAS VARIED PROGRAM

The latest developments in National and State Legislation and Food Fads and Misinformation will be among presentations to be given at the 1960 Woman's Auxiliary School of Instruction, Thursday, September 29, 1960, in the Cardinal Room of the Curtis Hotel in Minneapolis.

Registration and a coffee hour will be held from 9:00 to 9:30 a.m. and the Business Session will be held from 9:30 to 10:00 a.m.

The Food Fads presentation will be introduced at 10:00 a.m. with the showing of the AMA sound film "The Medicine Man."

Dr. Robert D. Semsch, chairman of the Public Health Education Committee of the Minnesota State Medical Association, will point out the importance of an educational program of this type and explain how Auxiliary members can assist in the project.

A representative of the Minnesota Dietetic Association will explain the details of the state-wide program to combat food fads and misinformation. The Auxiliary will co-operate in this project sponsored by the Minnesota Dietetic Association and supported by the Minnesota State Medical Association. The project will include a series of programs featuring a showing of "The Medicine Man." In conjunction with the showing of the film throughout the state, a physician and a member of the Dietetic Association will be present to answer nutritional questions.

For the session on Legislation, the Committee has invited Mr. Charles Johnson of the Field Services Division of the American Medical Association, Chicago, to present the latest information about Federal medical legislation.

Dr. Les N. Dale, Red Lake Falls, chairman of the Public Policy Committee of the Minnesota State Medical Association, will speak about 1960 legislative trends on the state level.

The Luncheon, which is scheduled for 12:15 p.m., will conclude the program.

* * *

RAMSEY COUNTY AUXILIARY HOLDS FALL FASHION SHOW

The annual Fall Fashion Show and Luncheon of the Ramsey County Medical Auxiliary was held Monday, September 26, at the St. Paul Hotel in St. Paul. Mr. Engelson of Rosen-Engelson Furs presented an inspiring fashion show.

Mrs. Marcus Shelander was in charge of the arrangements and Mrs. Walter Carley was in charge of the models. Mrs. Donald Roach and Mrs. Louis Nelson handled the tickets and reservations.

The Physician's Diary

Canby physician, **Dr. L. J. Holmberg**, was honored on his eighty-fifth birthday and his fifty-two years of medical practice by residents of that town. A dinner at 6:30 p.m. was followed by a program.

* * *

The American College of Physicians has elected **Dr. Sidney O. Hughes**, of Winona, as an associate of the group. His election was approved by the Board of Regents of the College who met in San Francisco, following certification of his qualifications for membership and approval of his nomination by the College's regional governor.

* * *

Dr. John K. Butler, Cloquet physician, has been installed as chief of the medical staff of the Community Memorial Hospital in Cloquet. **Dr. R. M. Eppard** is the retiring chief of staff. **Dr. C. E. Norberg** was selected as chief of staff-elect and **Dr. L. B. Backus**, secretary-treasurer.

* * *

Clinton, Minnesota, has a doctor. He is **Dr. Carl E. Christenson**, a recipient of the Rural Medical Scholarship awarded annually by the Minnesota State Medical Association. Under terms of the Scholarship, Doctor Christenson must practice in a rural Minnesota community in need of a doctor for at least five years. The residents of Clinton raised money and built a Clinic for Doctor Christenson.

* * *

One of three University of Minnesota doctors receiving grants totalling $54,340 for heart research was **Dr. C. Walton Lillehei.** He received $33,000 for work on the development of new methods for cardiac surgery. The awards are part of over a million dollars granted by the Life Insurance Medical Research fund this year. They enable researchers to study normal heart function as well as heart diseases.

* * *

The Park Region Medical Center has announced the affiliation of **Dr. Cheng-En Lu** to its medical staff. **Doctor Lu** is a graduate of the West China Union University. His wife is also a physician and is on the staff of the Fergus Falls State Hospital.

* * *

Dr. John M. Burns has now become associated with the Oliver Clinic in Graceville. Doctor Burns is replacing **Dr. C. J. Swendseen** who has left for Washington, D. C., where he is taking a three year residency in radiology. Doctor Burns will be associated with **Dr. I. L. Oliver.**

* * *

The American Protologic Society has elected **Dr. John R. Hill** of the Section of Proctology in the Mayo Clinic to the Council of the group. Doctor Hill will serve a term of two years. The organization was formed in 1899 to promote the study of protologic diseases.

* * *

The *Miami Herald,* on June 17, published a feature article about **Dr. Louis A. Buie,** emeritus member of the Mayo Clinic, entitled "Meet Mr. Ethics." In the article, Doctor Buie is praised for his work on the doctor's code of ethics of the American Medical Association. He was in charge of revisions of the "Principles of Medical Ethics" which serve as a guide for physicians in the conduct of their practice. Dr. Buie retired from the A.M.A. Judicial Council at the Convention held in Miami after serving for fifteen years. He is now working with a new A.M.A. group called the Medical Disciplinary Committee.

* * *

A new surgeon has joined the St. Louis Park Medical Center. He is **Dr. Earl G. Yonehiro,** a much decorated World War II combat veteran . . . member of the famed 442nd Regimental Combat Team. He holds the Silver Star and Purple Heart with two Oak Leaf clusters. Doctor Yonehiro is a graduate of the University of Rochester, New York, and took special work at Harvard.

* * *

Dr. W. C. Heiam has been elected chief of staff of the Cook Community Hospital in Cook, Minnesota. **Dr. Floyd J. Swenson** was elected secretary. **Dr. W. S. Neff,** Virginia, and **Dr. J. A. Malstrom,** Virginia, were appointed to organize by-laws for the new group.

* * *

A member of the Minnetonka Clinic in Excelsior, **Dr. Roger S. Johnson** has resigned from his partnership in that Clinic to begin studying under a Surgical Fellowship awarded him by the University of Minnesota.

* * *

Tracy physician, **Dr. W. H. Valentine,** was honored at a reception in honor of his eighty-fifth birthday and sixty years of medical practice. Over 150 guests were present, including former and present nurses, their husbands and Tracy hospital board members and their wives. Doctor Valentine began his practice in Tracy in 1900.

* * *

Dr. C. P. Johnson, of Tyler, has announced that **Dr. Richard Engwall,** Ivanhoe, and **Dr. Mark Muesing,** formerly of Duluth, have joined him in the practice of medicine. Doctor Engwall is a recipient of the Rural Medical Scholarship and a graduate of the University of Minnesota Medical School. Doctor Muesing is also a graduate of the University of Minnesota.



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Dr. William R. Hilgedick has joined the staff of **Dr. Ralph Papermaster** in Two Harbors. Doctor Hilgedick has served for two years in the U. S. Army Medical Corps in Formosa and is a graduate of the University of Minnesota Medical School.

* * *

The new doctor in Pine Island is **Dr. John Hetzler.** He is a graduate of the University of Minnesota Medical School and comes to the community of Pine Island from Mandan, North Dakota.

* * *

Dr. Homer H. Russ, formerly of St. Paul, has opened offices for general practice in the former Bowler Insurance Building in LeCenter. Doctor Russ is a graduate of the University of Minnesota Medical School and has recently completed his internship at Bethesda Hospital in St. Paul.

* * *

The Lakeland Medical Center of Willmar once again has the services of **Dr. Robert V. Hodapp.** Doctor Hodapp has been on leave of absence since July, 1958. He has been engaged in a pediatric residency training at the University of Minnesota and will limit his practice to pediatrics in Willmar.

* * *

The Bemidji Clinic has announced the addition of **Dr. Earl Gregoire** to its staff as a resident physician. Doctor Gregoire has replaced **Dr. George H. Spurbeck** who resigned after two years at the Clinic to accept a position as senior medical officer at the Veterans Administration Hospital in Fargo, North Dakota. Doctor Gregoire is a graduate of the University of Oregon Medical School. He will specialize in the practice of obstetrics and gynecology.

* * *

Dr. James R. Schuft is now in the practice of medicine with **Dr. Robert M. Watson** in Morris, Minnesota. Doctor Schuft is a graduate of the University of Minnesota Medical School.

* * *

Dr. William C. Bernstein, Director of the Division of Proctology at the University of Minnesota Medical School, recently addressed the Southwestern Minnesota Medical Association at Worthington on "Common Proctologic Problems." On June 23, he addressed the Wisconsin Academy of General Practice in Madison, Wisconsin, on "Present-Day Concepts of Polyps of the Rectum and Colon."

* * *

Dr. Edmund B. Flink, formerly of the Veterans Administration Hospital in Minneapolis, has accepted an appointment as Professor of Medicine and Chairman at the new West Virginia University in Morgantown, West Virginia. Doctor Flink began his duties the first of this month.

* * *

Belle Plaine, Minnesota, has recently acquired two new doctors. They are **Dr. Roger Hallgren,** who has just completed three years as a Captain in the Air Force Medical Corps, practicing in association with **Dr. H. M. Juergens,** and **Dr. B. D. Kaiser,** of Minneapolis, who

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has just completed his internship. He is moving into the office of the late **Dr. C. J. Olson.** He will be associated with two Le Sueur doctors in the formation of the Minnesota Valley Medical Clinic. Doctor Hallgren is a graduate of the University of Minnesota Medical School and Doctor Kaiser graduated from Creighton Medical School at Omaha.

* * *

A well-known St. Paul heart specialist, **Dr. A. E. Venables,** has opened practice in Biwabik, Minnesota. Doctor Venables will serve as a general practitioner on at least a three-day schedule. Dr. Venables, who had retired, was prevailed upon to open an office by the Biwabik Chamber of Commerce.

* * *

Nopeming physician, **Dr. Reno W. Backus,** has been named to serve on Minnesota Tuberculosis and Health Association Committees. He will be on the Medical Advisory and Nominating Committees. Doctor Backus is medical director of the Nopeming Sanatorium. He will help to determine how and where to spend the association's funds in an all-out program to eliminate tuberculosis which requires the financing of year-around testing surveys to detect tuberculosis, education projects and work in the fields of research and rehabilitation. **Dr. Arthur M. Olsen,** Mayo Clinic, is chairman of the Medical Advisory Committee, **Dr. Viktor O. Wilson,** Rochester, is chairman of the program committee.

* * *

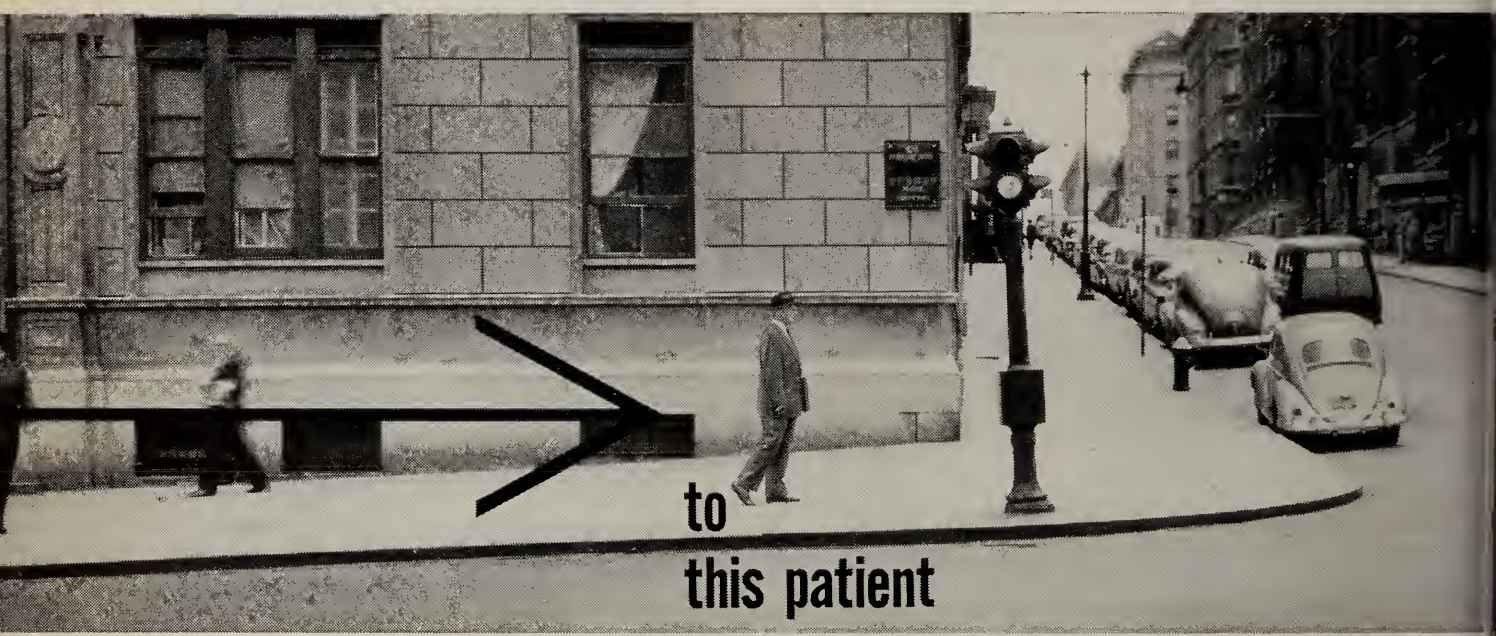
Dr. John Zachman, formerly of St. Paul, has become associated in the practice of medicine with his father, **Dr. A. H. Zachman** in Melrose. Doctor Zachman graduated from the University of Minnesota Medical School and was police surgeon for the city of St. Paul.

* * *

Drs. B. C. Ford, K. A. Peterson and **J. E. Eckdale,** of the Plaza Medical office in Marshall, announce the association of **Dr. Robert Phelps** in the practice of medicine. Doctor Phelps is a graduate of the Nebraska Medical College in Omaha.

* * *

The Medical Director of the Mineral Springs Sanatorium in Cannon Falls has been named to the qualifications and contract committee of the Minnesota Tuber-



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with intermittent claudication
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makes the blocks so much shorter...
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culosis and Health Association. He is **Dr. Jesse E. Douglass,** who recently completed an intensive TB case-finding survey in the schools of Dakota, Goodhue and Rice counties.

* * *

Dr. Donald Amatuzio was recently honored for chemical and physiological investigations at the Jay Phillips research laboratory of Mount Sinai Hospital. Doctor Amatuzio is a specialist in research on the effects of dietary oils on the level of cholesterol in blood. He is a graduate of the University of Minnesota Medical School.

* * *

The government of Belgium has honored **Dr. C. Walton Lillehei** for his work with Belgian citizens who entered University Hospitals for heart surgery. He was awarded the decoration of the Order of Leopold.

* * *

Dr. E. Graham Howard, Spring Valley, has re-opened his office. Doctor Howard had been away but returned recently.

Dr. Charles Scheifley, Consultant in Medicine in the Mayo Clinic since 1946, has resigned his position from the permanent staff to continue his medical practice and research studies at another location. He also participated at the recent Sixth International Congress of Internal Medicine in Basel, Switzerland. Dr. Scheifley is the recipient of a traveling fellowship grant awarded jointly by the Sandoz Chemical Works, Inc., of Hanover, N. J., and Columbia University, New York City, on the basis of previous researches in international medicine conducted by Dr. Scheifley at the Mayo Clinic.

* * *

The Southern Chapter of the American Academy of General Practice held a regional seminar recently. Among those attending were **Drs. Donald Limbeck** and **Dale Bergeron** of LeSueur.

* * *

Dr. J. J. Ahlfs, Caledonia, has announced the appointment of **Dr. A. D. Davidson** in the practice of medicine. Dr. Davidson is a graduate of the University of Minnesota.



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(1) Abraham, W., in Green, J. R., & Steelman, H. F.: Epileptic Seizures, Baltimore, Williams & Wilkins Company, 1956, p. 132. (2) Crawley, J. W.: M. Clin. North America 42:317 *(March) 1958. (3) Bray, P. F.:* Pediatrics 23:151, *1959.*

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Viruses and the Public's Health

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VIRUSES are the most notorious cause of communicable disease today. They account for the lion's share of current infectious illness, ranging from the commonplace and mild to the rare, crippling, and deadly. The viral diseases of childhood—measles, mumps, chickenpox, and rubella—are accepted as a part of growing up and are considered alarming chiefly when they occur outside the usual age limits or when they pave the way for serious complications and chronic conditions. But others, particularly those that attack the central nervous system, like rabies, encephalitis, and poliomyelitis, spring to mind automatically whenever the term "dread diseases" is mentioned.

Few, if any, parts of the body seem to be safe from these highly selective, intracellular parasites. Some attack the brain and central nervous system, others the respiratory tract, still others the digestive tract, and so on down the line. There are even species that produce plantar warts on the soles of our feet. All living things, man, animals, and plants, are confronted with an array of viruses that have a unique preference for them as hosts and for specific systems within them. Even bacteria can be destroyed by tadpole-shaped viruses, called bacteriophages.

25th Annual John W. Bell Tuberculosis Lecture, delivered at a meeting of the Hennepin County Medical Society, Minneapolis, Minnesota, May 2, 1960.

Viruses, by their very nature, have presented obstacles to study. The majority of them have been unknown, unseen adversaries, manifesting themselves chiefly by what they do and how they spread. Consequently, they have been poorly understood. The contrast between our basic knowledge of viruses and bacteria shows up conspicuously in the degree of control that has been achieved against the two. Through accurate diagnosis, general and specific preventive activities, and chemotherapy, the sting has been removed from many bacterial diseases. Of course, there is still uncharted territory to be explored, interpreted, and conquered in this category also. Those of you who work in the tuberculosis field or with other bacterial diseases are aware of the unfinished business that stands between you and the goals you are seeking to achieve. Nevertheless, taken as a whole, the bacteria represent a diminishing threat to human life.

The situation is quite different with regard to the viral diseases. Spectacular triumphs against a few individual viral diseases stand out in a strong relief to the general rule. For instance, we have enough information on some to control them through immunization of human and animal hosts, or through control of insect vectors and environmental factors. Oddly enough, the first types of immunization ever to be developed were directed against viral diseases—innoculation and vaccination for smallpox and prophylactic treatment for rabies. For most viral diseases, however, the fund of knowledge is still inadequate to the task. At present, only a few are preventable and even fewer are amenable to chemotherapy—principally those of the psittacosis-lymphogranuloma group.

Elaboration of control measures for any infectious disease usually awaits precise knowledge of the causative organism, its ecology, and modes of spread. We are just beginning to strip the viruses of the obscurity that has sheltered them in the past. Under the spotlight of increasing intelligence, earlier concepts of viral diseases are enlarging and sometimes changing and the number of known pathogenic viruses is skyrocketing. At the turn of the century, only a dozen or so human viruses were known. Fifteen years ago, there were probably not more than 70. Today there are upwards of 150, with new ones coming up regularly. At last, we are beginning to hurdle series of obstacles that stood in the way of understanding these elusive pathogens. In this lies the expectation that we will soon accumulate sufficient knowledge to tip the balance against an increasing number of viral diseases.

The word "virus" originated during the Middle Ages to denote a venomous exudate from wounds. Later, invisible substances were found to be the cause rather than the result of infective processes. With acceptance of the germ theory of disease, bacteria were isolated, cultured, examined under the microscope, identified and associated with specific disease conditions. Their ecology was studied, their modes of spread were determined, and rational methods of control were developed. However, there remained a number of infectious diseases for which no bacteria could be found. Bacteriologists found that infective particles, small enough to pass through the pores of porcelain filters, could produce disease. The term "filterable" virus was applied to these pathogenic substances for many years. Because the tools of the bacteriologist, chemist, and physicist were inadequate to penetrate their secrets, viruses remained invisible and inscrutable. They were distinguishable by their capacity to spread and produce disease.

Viruses have many qualities that set them apart from bacteria. Most of them are too small to be examined under the ordinary microscope and identified by their morphological characteristics. They cannot be grown in culture media suitable for bacteria, since they multiply and take on the attributes of life only within susceptible living cells. They cannot be tasted, smelled, touched, or measured by methods commonly used for other pathogens. Like ideas, they are intangible, pervasive, able to spread and bear fruit only among those who are susceptible to them. To carry the comparison a step farther, they are equally difficult to defeat. That is why we speak of the "virus" of ideologies, political and social, that are in opposition to our way of life.

The first real breakthrough in the scientific study of viruses came years ago with the discovery that some human and animal disease processes could be reproduced in the suckling white mouse and that virus could be cultivated and harvested in the embryonated chicken egg. The mouse has been joined by more expensive and complicated animals such as the Rhesus monkey. However, we are still handicapped for convenient intact laboratory animals to serve as substitute hosts for

most of the human viral diseases.

Until recently, cultivation and isolation of viruses was a cumbersome, tedious, and expensive procedure. Advances in tissue culture methods have now placed it on a more practical footing. The use of tissue cultures for the propagation of viruses dates back to 1913. Inherent problems limited their use to the research laboratory. In 1949, Enders and his associates reported growing poliovirus in monkey kidney cells, the first successful attempt to cultivate it in non-nervous system tissues. Since then several kinds of tissue cells have proved suitable for the propagation of one virus or another. Monkey kidney cells, human amnion cells, HeLa cells, and others are now widely used for the growth and differentiation of viruses. The ordinary microscope and antibiotics have found their niche in virology. The destructive changes that occur in infected tissues can be seen and studied under the low-power microscope. Antibiotics, which are of no avail in the treatment of most viral diseases, serve as an adjunct to virus studies by keeping down bacterial contamination in the tissue cultures.

Serological work on the viruses has also advanced, with laboratory techniques developing around specific antigen-antibody systems. Most of these tests are not yet specific enough for clinical epidemiological purposes. They provide evidence of past infection, which is useful in constructing a profile of previous viral experience within a community. So far, it has not been possible to distinguish between the antibodies acquired by natural infection for poliovirus, for example, from those induced by vaccine.

Some interesting questions have been raised as a result of finding rabies antibodies in healthy, trapped wild animals. Bats have been known to carry the virus for months without developing clinical symptoms of the disease, but they were thought to be exceptional in this respect. How and when these other animals received their exposure to the virus is unknown. Since we have no knowledge of subclinical rabies infections, the significance of the finding is not understood at this time.

A number of serological tests for viruses are being studied in conjunction with the fluorescent antibody technique for rapid diagnosis. The diagnostic test for rabies has been field tested and found specific and practical enough for wide-scale use, with results obtainable within a day. To the bite victim and the physician or public health worker who must cast the die for or against the Pasteur treatment, this time-saving element is of inestimable value.

The electron microscope, with magnifications up to 200,000 times, has brought viruses within the range of vision. A technique called metal shadow casting provides the necessary contrast between the background material and the viral particles. Many investigators have photographed different viruses of varying sizes and shapes. Each follows its own geometric pattern—the influenza virus, for example, looks like a fluffy powder puff. The antibody molecule, which immunochemists believe is a few millimicrons smaller than the encephalitis virus may someday be seen.

Scores of previously undiscovered viruses have been identified within the past few years. When so many new microorganisms come to light so rapidly, it takes time to sort the pathogens from the harmless saprophytes and to determine whether they are agents of known or new diseases. A virus is usually considered pathogenic when it is frequently found during a characteristic illness; when specific antibodies develop in the host; and when the isolated virus produces a similar disease picture in other susceptible hosts.

As the new viruses have been identified and associated with disease states, many have been found to produce signs and symptoms that formerly pointed to other agents. This characteristic is shared with other kinds of pathogens also. In suspected tuberculosis, the culprit may turn out to be a fungus, one of many atypical acid-fast bacilli, or something else quite distinct from the tubercle bacilli. Wisdom dictates that a clinical diagnosis of poliomyelitis be followed by a question mark until the presence of poliovirus is confirmed in the laboratory, for the symptoms may be caused by one of the other enteroviruses. The encephalitis syndrome requires careful definition of its source; it may be produced by any of a variety of viruses, arthropod-borne and otherwise, bacteria, fungi, or protozoa, or chemicals. For reasons such as these, diagnostic dependence on clinical evidence alone has lost much of its validity in regard to the infectious diseases. In the closely-welded partnership now necessary between the clinician and the laboratory diagnostician, the laboratory acts as arbiter when the identity of a causative agent is in doubt.

But the diagnostic dilemma is not necessarily

solved when a disease state is correctly tagged with the family name of the causative organism. Also to be taken into consideration are the types and strains, which often have individual antigenic properties. This is true of other organisms as well. Only certain strains of the staphylococcus, for example, are antibiotic resistant and produce epidemics.

The classification and naming of viruses is still in a fundamental stage. The Coxsackie viruses were so named because they were first isolated from residents of Coxsackie, New York. Together with the polio and ECHO viruses, they are classified as enteroviruses because their habitat is in the intestinal tract. Their most drastic effect is on the central nervous system. Members of the ECHO group were originally described as orphans in search of a disease. The word "ECHO" was coined from the first letter of each attribute of these viruses: enteric, cytopathic, human, and orphan—in the sense that they had no known link with any pathological condition at the time they were discovered. The arthropod-borne viruses do not have one single property in common. Many that are transmitted by mosquitoes and ticks produce dissimilar diseases like encephalitis. yellow fever, dengue, and a host of others. Some have been placed in the group solely because they have an antigenic relationship with known members. Like the bat salivary gland virus, they may not be spread by arthropods at all. Dissatisfaction with nomenclature dates back to antiquity. More than 2,000 years ago, Plato commented in *The Republic:* "They do certainly give very strange and newfangled names to diseases."

Despite the number of known viruses today and the unfolding of their pathogenic role, the etiology of the vast majority of infections of the respiratory, gastrointestinal, and central nervous systems is still undetermined. The present status of virology has been compared to that attained in bacteriology fifty years ago.

Probably no infectious diseases are more persistent and widespread than those of the respiratory tract. The bacterial diseases have been studied extensively and a great deal of progress has been made against them. Advanced chemotherapy has pulled down the mortality from these diseases, although the morbidity rate still leaves much to meted from first place as a death-dealing infectious be desired. Tuberculosis, for example, has plum-disease to twelfth place, but the attack rate has not dropped as drastically. Bacterial pneumonias also claim far fewer lives than they once did. The viral respiratory diseases are now of major concern. Until recently, a sound etiological relationship of viruses to major human respiratory diseases had been established only for influenza and psittacosis. Both of these viruses were identified during the 1930's, and both have been the subject of extensive investigation.

Influenza pandemics and epidemics have long been of concern to people who are interested in respiratory diseases. Even when the influenza itself is not particularly severe, it is followed by a wave of mortality in excess of normal expectations. These deaths are usually attributed to pulmonary and cardiac conditions. It is well known that pathogenic bacteria take advantage of the derangement of the respiratory tract during an influenza attack and readily produce pneumonia. Of the many possible complications in influenza. only the bacterial yield to chemotherapy.

Since the influenza virus was isolated in 1933, four major immunological types—A, B, C, and D —have been differentiated. Most epidemics have been associated with Type A, and some outbreaks with Type B. Type C appears to be relatively rare. Type D is variously known as parainfluenza 3 or Sendai virus. We will refer to it later. Each of these influenza virus types has a multitude of strains, which occur in families in Types A and B. These strains are so closely related within their respective families that immunity to one confers immunity to others in the same family but does not extend to other families of the same type. The Asian strain that swept across the world in 1957 was a new family of Type A virus with antigenic properties different from those of other strains. Neutralizing antibodies were found only in a few elderly people in the Netherlands and the Boston, Mass., area. Possibly the Asian strain was somehow related to the one responsible for the 1890 influenza epidemic. Because the Asian strain was different from those that have been prevalent within the lifetime of most people. susceptibility was high. Also, existing vaccines were ineffective against it and a special one had to be developed using the Asian antigen.

We are all familiar with the story of how the Asian strain was isolated and how its spread was traced from Hong Kong around the world. Excellent health teamwork, nationally and internationally, played a large part in helping us

prepare for the epidemic in this country. Time and place also worked to our advantage. Summer intervened between the alert signal and the establishment of the virus in this country. During the relatively influenza-free summer months, approximately 40 million doses of vaccine were started in production. Had the mutant strain developed in this hemisphere north of the Equator, we would not have had this period of grace.

Influenza viruses of one type or another are almost constantly present in a few people everywhere, and the general population develops some degree of immunity against them. When variants develop, as they frequently do with influenza viruses, the new strains that are least readily neutralized by existing antibodies in the population have the best chance to survive and establish themselves as successful pathogens. Specific vaccines will probably always have to be developed against such strains under emergency conditions. Vaccination is our only weapon against epidemic influenza.

Although Asian influenza was not caused by a lethal strain, the familiar pattern of excess pneumonia-influenza mortality followed its successive waves, particularly among elderly people. In the six-month period from October 1957 through March 1958, there were nearly 88,000 excess deaths in this country as compared with comparable periods in 1956 and 1957.

A profusion of myxoviruses, ECHO viruses, adenoviruses, and others have been identified and associated with respiratory infections in recent years.

When the myxoviruses were first identified, the group included only the viruses for influenza, mumps, and Newcastle disease of fowls. A number of new viruses have since been added to the group. Influenza virus D, better known as Sendai virus and as parainfluenza 3, was isolated in Japan, where it was reported to be an important cause of pneumonitis in infants. It was also recovered from rodents and swine. In this country, this virus caused 50 per cent more cases of acute respiratory disease and pneumonia in hospitalized children in one city during the Asian influenza epidemic than the Asian strain itself. It has now been isolated from nasal secretions and diseased lungs in calves and cattle during outbreaks of respiratory disease among them. This virus is being studied by the Public Health Service and the University of Maryland as a possible cause of shipping fever in livestock. Parainfluenza virus 3 spreads so readily from one person to another that no animal source is needed to explain frequent human infections. However, the animal study may provide a better understanding of viral respiratory disease in humans as well as in cattle and also give some indication of the value of vaccines against it.

When the adenoviruses were found in association with acute respiratory illness in military populations in 1954, it was hoped that the etiology of much undiagnosed illness would be established. Although these agents have been isolated from human tonsils and adenoids all over the world, they account for only a small proportion of the total respiratory illness in civilian populations. During the first flush of hope about these viruses, a vaccine was developed against them. It is now used chiefly in military populations where the incidence of adenovirus infections remains high, particularly among recruits.

Some of the ECHO 10 viruses in the enterovirus group are thought to cause respiratory infections in children. Sabin has proposed reclassifying ECHO 10 as Type 1 of the new Reovirus group because of its size, effect on cells, epidemiological pattern, and its association with respiratory diseases in man and lower animals.

In quest of the cause of the common cold, investigators have recovered a number of miscellaneous viruses, but none has proved to be the single cause. The Salisbury Hospital's Common Cold Research Unit in England has persistently attempted to establish the relationship of a variety of viral isolates with common cold symptoms in human volunteers. They introduce the isolates directly into the nasal passages of the volunteers. It appears the humidity and a number of unknown factors influence the host response to infection.

Another group, the enteroviruses, is composed of at least sixty distinct strains of poliomyelitis, Coxsackie, and ECHO viruses. They have much in common in regard to laboratory characteristics, particle size, disease syndromes, and epidemiologic pattern. These viruses are important public health problems because they cause widespread epidemics, particularly during the summer. Man appears to be the natural host for these viruses, although some ECHO types have been recovered from monkeys, cattle, and swine. Transmission of the enteroviruses follows a fairly direct route from person to person.

The three types of polioviruses are the best known of this classification. They have been studied over decades and an over-all picture has been obtained of the pattern of their occurrence, routes of transmission, and results of their presence. The polioviruses are the only members of the category for which we have some measure of control. The Salk vaccine has proved highly effective in preventing paralytic cases of polio and has maintained its safety since the initial incident in 1955. Despite the availability of a safe, effective vaccine, the annual case rate of poliomyelitis has continued to rise in the past several years. Analysis of morbidity data shows the heaviest concentration of paralytic cases among unvaccinated preschool children in low socio-economic groups. Experience has not confirmed the belief that people universally and voluntarily would avail themselves of the protection afforded by the vaccine. Some 34,000,000 people in the vulnerable under-forty-years-of-age group, including half of the children under five, have not had a single dose of the vaccine.

Debates have raged around the comparative advantages of a killed virus vaccine and one made from attenuated strains that have lost their power to attack the nervous system. Proponents of the killed vaccine point to its safety. It is recognized, however, that an immunized individual can still pick up, propagate, and excrete the virulent strains. Although he himself is immune, he constitutes a hazard to his susceptible associates. Proponents of the live vaccine point to the possible extension of protection beyond the primary recipients of the vaccine. They state that secondhand immunizations occur as attenuated strains pass naturally from vaccinated individuals to their contacts. These naturally infected persons would then become links in the further transmission of the strains. Succeeding generations of the tamed and disciplined strains would possibly supplant the wild virulent strains in the population. The successful application of this theory depends on the continued stability of the attenuated strains through innumerable human passages. To operate as predicted, the strains would not only have to retain their capacity to induce antibodies against their virulent counterparts, but also show no sign of reverting to their neurotropic characteristics.

Attenuated vaccines have already been tested with no ill effects in Nicaragua and Russia, and are now being tried under carefully controlled conditions in other parts of the world including your own state of Minnesota. In a recently completed study in a suburb of Philadelphia, live attenuated poliovirus was administered orally to eighteen infants. Antibody production was good, with seventeen of the children responding to all three types of virus and the eighteenth to types 1 and 3 only. Within fifteen weeks, 42 per cent of the siblings and 11 per cent of the susceptible adults had acquired antibodies. Live virus was then fed to the sero-negative adults and siblings under fourteen years of age with 50 per cent and 91 per cent respectively developing infection. Attempts to reinfect the individuals who had been fed virus or who had acquired a natural infection showed that they had developed resistance to it, for they excreted virus for only two days. There were no illnesses related to the vaccine. After one to three human passages, recovered virus was inoculated intracerebrally in monkeys with no significant evidence of neuropathogenicity.

Another study at Tulane University School of Medicine is underway to determine the susceptibility of newborn infants to the Sabin live poliovirus. At two and thirty days of age, infants will be fed various doses of all three types of attenuated virus, separately and in combination. Blood and fecal specimens will be studied for the presence of antibodies and for the excretion of virus respectively.

These examples indicate the painstaking and detailed investigations that must be undertaken before a vaccine can be released for general use.

The Coxsackie and ECHO viruses are more versatile than the polioviruses. Their repertoire includes non-specific febrile illness, with or without rash, aseptic meningitis, herpangina, pleurodynia, myocarditis, and sometimes respiratory and diarrheal diseases, depending on the species and strains involved. Clinical features of enterovirus infections frequently overlap. For this reason, laboratory diagnosis is essential in the specific diagnosis of enterovirus disease. State and regional virus laboratories across the country have access to the Communicable Disease Center's reference diagnosis service when the identity of an isolate is in doubt.

The Coxsackie viruses, discovered in 1948 during poliomyelitis investigations, were found initially in association with non-paralytic polio, mainly in young people. A few years later, they were joined by the ECHO viruses.

As producers of aseptic meningitis, the Coxsackie and ECHO viruses act very much like the polioviruses. Paralysis, especially residual paralysis, is rare. Approximately, a score of paralytic cases have been reported in the literature during the past ten years. Development of paralysis is generally presumed to indicate poliomyelitis; absence of the syndrome does not necessarily absolve the polio agents.

The Coxsackie and ECHO viruses are believed to be worldwide, and like poliovirus, more endemic in warmer climates. Infection is year-round, with more illness during warm months. They follow the poliovirus pattern in regard to age, sex, race, and socio-economic groups.

Epidemics are typically localized and sporadic, varying in etiology from place to place during the same year. Iowa has studied the enteroviruses extensively, having had an unusual experience with them. Within a radius of 100 miles, an epidemic of ECHO 4 occurred in 1955, of Coxsackie B5 in 1956, and of poliovirus 1 in 1959.

Every possible combination of enteroviral infection has been found. This has led to a great deal of speculation regarding interference, non-interference, and potentiation between virus types. So far, there is little direct information. Sabin and others have encountered instances where naturally occurring enteroviruses appeared to interfere with live virus polio vaccine. Some authors have reported that polio epidemics started later than usual when they were preceded in the area by other enteroviral epidemics.

The enteroviruses are intimately associated with man in the absence of disease, and actual illness appears to be an unusual response. Perhaps this should not be considered strange, since nature furnishes a number of instances in which humans, other animals, plants, insects, and even bacteria harbor viruses, yet manage to keep the host-parasite relationship in a state of equilibrium.

Because the enteroviruses constitute an important public health problem, the Communicable Disease Center is initiating a surveillance program on them in ten to twelve cities throughout the country. Minneapolis will be included as one of the cities selected for the large-scale live polio vaccine field study. Monthly fecal specimens and annual blood specimens will be obtained from healthy young children for analysis of seasonal, annual, and geographic variation of polio, Coxsackie, and ECHO viruses. By comparing the subclinical flow of enterovirus infections with the occurrence of clinical disease, some clue may emerge to explain, and possibly predict, outbreaks.

Also, the study will provide a means of accumulating a background picture of the prevalence and characteristics of naturally-occurring wild polioviruses and other enteroviruses before the live virus polio vaccine is used. It should then be possible to determine the effect of its use on the natural occurrence of these viruses.

Many of the viruses, old and new, are specific for one kind of animal or another. The arthropod-borne viruses are particularly interesting because at least three types of creatures have a part in the infection cycle. The first viral disease in which arthropods were shown to be essential in the maintenance and dissemination was yellow fever. Later their role was defined in regard to dengue and several encephalitis viruses. Upwards of 100 viral agents are now known to be transmitted by arthropods, particularly mosquitoes and ticks. In this country, the most important arbor viruses, as they are called for brevity, are eastern, western, and St. Louis encephalitis viruses. Each of these is recognized as a public health problem somewhere in the United States. Birds and mosquitoes apparently maintain eastern encephalitis in fresh water swamps in the eastern part of the country; hibernating mosquitoes are thought to be important in keeping western encephalitis alive through adverse weather in the western part of the country, and birds may carry latent St. Louis virus. It appears that man is an incidental and terminal host in these infections.

One highly specialized type of virus invades bacterial cells and literally disintegrates the host cell. These bacteriophages have been put to use by the laboratory diagnostician and the epidemiologist. Antibiotic-resistant epidemic strains of staphylococcus can be identified by phage typing. Their spread can then be traced through the hospital or community. Phage-typing is of no significance in scattered infections; it is an invaluable tool in an epidemic. A few years ago, the technique helped track down the source responsible for thirty-four cases of typhoid fever in eight states. The common denominator in this outbreak was a summer meeting of a religious sect in the Midwest.

The capacity of bacteriophages to destroy the bacteria susceptible to them has led to some conjecture in regard to their potential therapeutic

value. So far, however, nothing positive has come out of limited experimental work in this direction.

Judging from the sheer number of viruses brought to light in recent years, and the number of remaining diseases for which we have no known cause, may we not expect a growing harvest of new viruses and a linking between them and these diseases? Even now, the relationship between viruses, tumors, and other diseases of unknown etiology is being probed. Also under scrutiny is the disease-producing effect of viruses and bacteria in combination. The serious import of bacterial complications superimposed on viral infections, such as influenza, is a case in point.

As we move into a new way of life characterized by urbanization, industrial expansion, and technological developments, we need to explore their relationship with viral infections. The physical and chemical contamination of our food, water, and air may have more bearing on the subject than appears at first glance.

For example, abundance evidence exists that viral hepatitis is water borne. Many communities are pouring enormous quantities of disease-carrying sewage—raw and untreated—into the water sources of their downstream neighbors. As you know, water treatment is designed to cope with enteric bacteria, not with viruses. In addition to human and domestic wastes, some 7,000 new industrial and agricultural chemicals also are finding their way into our water supply each year. If, as some scientists surmise, detergents dumped into our water increase cell permeability, these chemicals alone may be heightening our susceptibility to hepatitis and other viral infections. What the cumulative effect of all the contaminants may be is unknown.

Air—the environmental factor that surrounds us twenty-four hours a day and without which we cannot exist—has become the carrier of a large amount of pollutants in urban areas everywhere. The cleanest air in these communities is five times as dirty as that in non-urban areas, according to the National Conference on Air Pollution, held in Washington, D. C., in 1958. Automobiles, barbecue pits, trash burners, furnaces, and domestic and industrial smoke stacks belch harmful gases and unconsumed chemical particles into the air. The National Air Sampling Network monitors the air in 240 cities and non-urban sites, analyzing samples for thirty specific inorganic substances. Some of these substances are being tested for possible tumor production in experimental animal colonies. Follow-up studies of residents of Donora, Pennsylvania, and other smog-stricken cities show that contaminated air apparently plays a role in the development of chronic diseases—respiratory and chest conditions, among others. It seems quite likely that contaminants in the air pave the way for viral respiratory infections.

The use of antibiotics in animal feeds raises questions, also. If sufficient amounts are carried over into our table meats and poultry, they may decrease the normal complement of intestinal bacteria, leaving the field free of competition for the viruses.

These are only a few of the possible ways in which modern life can contribute to our susceptibility to viruses. Hovering over the entire subject, of course, is the question of host response. We still do not know what makes one person sicken and another remain well under the onslaught of pathogenic organisms. We are still speculating about the long-term effect of the stresses inherent in our way of life.

Virology may be on the threshold of its golden age, just as bacteriology was many years ago. Research is constantly broadening the horizon. While research is seeking answers to basic questions, there is much we can do on the basis of the knowledge we already have. Like the poet, we can try to see the unseen in the seen. This is not an unrealistic approach, for the effects of viruses can be seen and studied, although the agents themselves are not readily visible. Pioneers in tuberculosis work tackled control programs while knowledge of the organism was in its infancy. Laboratory research is still going on all over the world to fill the voids in our knowledge. In the viral disease field, epidemiologists and physicians are helping to trace the pattern of viral spread and behavior, whether the agents are known or unknown, single or multiple. They have ample precedent for bringing their own resourcefulness to bear on the problem of control.

The idea of viruses is intriguing. It is full of subleties and imponderables that beckon us on. Best of all, it plants within us the virus of ideas that will take shape and grow. Where they will lead, we cannot predict. Bacteriology gave medical science the investigative approach. Virology, as it matures, may open new medical frontiers that now seem dim and far away.

ILLNESSES DUE TO COXSACKIE VIRUSES

1. HERPANGINA
2. "THREE DAY FEVER"
3. ASEPTIC MENINGITIS
4. EPIDEMIC PLEURODYNIA
5. PERICARDITIS
6. MYOCARDITIS (INFANT AND ADULT TYPES)
7. ORCHITIS
8. LYMPHADENOPATHY AND SPLENOMEGALY SYNDROME
9. COMBINATIONS OF THE ABOVE.

TABLE I.

COXSACKIE DISEASE

I. Group A	ASEPTIC MENINGITIS HERPANGINA PERICARDITIS (1 case)
II. Group B	PLEURODYNIA ASEPTIC MENINGITIS MYOCARDITIS NEONATORUM PERICARDITIS ORCHITIS COMBINATIONS OF THE ABOVE

TABLE II.

Coxsackie Disease

Report of a Syndrome due to Coxsackie Virus Group B, Type 2

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Since it was first discovered in 1947, Coxsackie virus has been shown to cause a variety of syndromes. These are discussed in detail and illustrated by a case report.

THE PURPOSE of this paper is to describe a clinical syndrome consisting of pleurodynia, pericarditis and orchitis caused by Coxsackie virus, Type B-2.

Coxsackie virus was discovered in 1947. Group B Coxsackie virus was shown to cause epidemic pleurodynia (epidemic myalgia, Bornholm disease) and a form of aseptic meningitis in 1950. Group A Coxsackie virus was shown to cause herpangina in 1951, and in 1952 a Group B virus was shown to be causally related to epidemic myocarditis in the newborn.[1]

[1]Presented at the spring meeting of the Minnesota Society for Internal Medicine, Saint Paul, Minnesota, in May, 1960.

Virology

Classification of Coxsackie viruses into Groups A and B is based on the type of lesions produced by these agents in suckling mice. Group A virus produces an intense myositis which causes muscle paralysis in injected mice, and certain strains of Group A produce poliomyelitis-like lesions. Group B virus produces degeneration of fat, encephalomalacia, hepatitis, myocarditis and occasionally pancreatitis in injected mice. This tropism is relatively specific but is in part dependent upon the route of inoculation.

Five distinct types of Group B and 25 types of Group A have been separated antigenically.[2] All five types of Group B and many of the Group A types are known to cause human disease.

Clinical Illnesses Due to Coxsackie Viruses

The many syndromes ascribed to Coxsackie viruses are listed in Table I.[3] Group B Coxsackie

viruses cause more different syndromes than Group A, as shown in Table II.

Herpangina is a summer disease of children due to Group A Coxsackie viruses. It is recognizable by the distinctive ulcerative lesions in the pharynx, and is usually a benign and uncomplicated illness.

Aseptic meningitis has been shown to be caused by all five types of Group B Coxsackie virus by isolation of the virus from spinal fluid of patients ill with this disease. Many such cases are clinically assumed to be instances of non-paralytic poliomyelitis. One such epidemic in Minnesota in 1956 was due to Coxsackie B-5 virus.[4] Aseptic meningitis may also co-exist with pleurodynia,[5] and may be caused by certain Group A viruses.

Epidemic pleurodynia (Bornholm disease) has been described clinically since 1872. For ten years various epidemics have been proved to be caused by various types of Group B Coxsackie virus, but Group A has not been found to cause this illness. Orchitis is the most common complication of pleurodynia, and patients with orchitis of unknown cause should be studied for Coxsackie infection.[5]

Myocarditis of the newborn has been shown to be produced by Group B Coxsackie viruses since the 1952 epidemic of Bornholm disease in Johannesburg. Various types of the B Group have been recovered from feces and heart muscle in cases of myocarditis neonatorum. Myocarditis has also been described in other than newborn patients. McLean[6] described myocarditis in a five-year-old boy due to Coxsackie B-2 virus. Null and Castle[3] found two cases of myocarditis which produced frank congestive heart failure in adults in the Salt Lake City epidemic due to Coxsackie B-5 virus.

Benign pericarditis has been reported due to Coxsackie virus type B-4[7] and B-5[8] in 1957. Movitt[9] reported cases of pericarditis due to types B-3 and A-1 in 1958. This is the only case in the literature of pericarditis due to a Group A Coxsackie virus.

In 1958, McLean and co-authors[10] saw four children with pericarditis during an epidemic of pleurodynia and aseptic meningitis in southern Ontario which was proved to be due to Coxsackie B-5 virus. They recovered type B-5 virus from the feces of all of these children with pericarditis, and demonstrated a significant rise in antibody titer to this virus in the patients' sera.

In 1959, Roberts and co-workers[11] discussed Coxsackie pericarditis and reported a case of pleurodynia, aseptic meningitis, orchitis and pericarditis due to Coxsackie B-5. Sode reported a case of pericarditis and pneumonitis due to Coxsackie B-2 virus in 1959.[2] Bell and Meis[12] reported a laboratory infection with Coxsackie B-3 virus which produced pericarditis and pleurodynia.

Two epidemics have been reported which illustrate the spectrum of disease produced by Coxsackie virus. Null and Castle[3] described an epidemic in Salt Lake City due to Coxsackie B-5 virus in which seventeen cases were well studied. Eleven of these had pleurodynia, one had aseptic meningitis, one had meningoencephalitis with paralysis, and four had pericarditis. As mentioned, two of these four cases of pericarditis had an associated myocarditis of sufficient degree to cause frank congestive heart failure. Gordon et al[5] reported the extensive California epidemic of 1956 due to Coxsackie B-5 virus. These workers studied 500 cases of epidemic pleurodynia, mostly in children and young adults. They noted, in addition to "pure" syndromes of pleurodynia and aseptic meningitis, combinations of these two. They also found seven cases of pericarditis in this epidemic and noted pleural effusion in three cases. One of Movitt's cases also had a large bloody pleural effusion.[9]

Gillett[13] summarized the reported cases of pericarditis due to Coxsackie viruses in 1959, and listed a total of nineteen cases. Sixteen of these were due to type B-5, two were due to type B-3, and one was due to type A-1.

Diagnosis

It is obvious that one must think of Coxsackie virus infection whenever one sees a clinical syndrome of chest pain, pericarditis, orchitis, or aseptic meningitis. Combinations of these or epidemics of these illnesses should be strongly suggestive of the diagnosis of Coxsackie disease.

Herpangina must be differentiated from primary herpetic gingivostomatitis. Aseptic meningitis due to Coxsackie virus must be differentiated from mumps meningoencephalitis, lymphocytic choriomeningitis, and non-paralytic poliomyelitis. Pleurodynia may simulate pneumonia, pleurisy, or coronary thrombosis. The combination of meningoencephalitis and orchitis may suggest either mumps or a Coxsackie infection.

The diagnostic criteria for a Coxsackie virus infection are:[14]

1. A clinical syndrome of previously unknown

or questionable etiology which is not associated with any known pathogens.

2. Antibody response to Coxsackie virus of four-fold or greater in paired serum specimens.[15]

3. A Coxsackie virus should be recovered from the patient.

The following report presents a case in which these diagnostic criteria were met.

Case Report

A white male office worker, aged thirty-three, became ill September 16, 1959, with fever, interscapular and substernal chest pain. The pain was aggravated by respiration. He denied any symptoms of upper respiratory infection. On examination, the temperature was 101° F and the patient was "splinting" the chest in severe pain. The heart and lungs were normal at this time. No pericardial or pleural friction rub was heard. Chest radiograph and electrocardiogram revealed no abnormalities on this date.

On September 19, the patient was seen again and still complained of severe chest pain requiring potent analgesic agents. On this occasion, a loud pericardial friction rub was noted which disappeared within the subsequent twenty-four hours. He was admitted to the hospital for further study on September 20. He remained febrile and in pain on that day and the next, and on the latter day he had intermittent periods of confusion and disorientation. Repeated physical examinations were essentially normal. Repeat chest radiograph and electrocardiogram on September 20 gave normal findings.

Laboratory studies were as follows: hemoglobin 16.1 grams per cent, white blood count 7,800, (neurophils 52%, lymphocytes 41%, monocytes 2%, eosinophils 5%). Sedimentation rate 25 mm/hour. Throat culture grew only normal flora. Urinalysis was normal. ASO titer was 12 Todd units. VDRL negative. Heterophile agglutination positive 1:28. Cold agglutination negative. No rise in titer developed against mumps, Western-equine encephalitis, or lymphocytic choriomeningitis virus in paired serum specimens obtained on Septemer 21 and 30.

Coxsackie virus type B-2 was isolated from the stool on October 2. The neutralizing antibody titer against Coxsackie virus B-2 rose from less than 1:4 on September 22 to 1:256 on October 18.

The patient became afebrile on September 22 and was discharged from the hospital. He remained well until September 27 when he again developed fever, chest pain and an acute orchitis. At this time, examination disclosed a transient pleural friction rub and evidence of acute orchitis. Laboratory work on this date disclosed a white blood count of 11,350 with 81 per cent neutrophils, 18 per cent lymphocytes and 1 per cent basophils. Sedimentation rate was 29 mm. per hour. Repeat chest radiograph on September 28 was again normal except for elevation of the right diaphragm. By September 30, the orchitis subsided along with the chest pain and fever, and the patient made an uncomplicated and uneventful recovery.

Summary

A syndrome of pericarditis, pleurodynia, and orchitis has been presented which was proved to be due to Coxsackie virus type B-2 by isolation of this agent from the stool and by demonstration of an eight-fold increase in specific neutralizing antibodies.

The spectrum of disease caused by Coxsackie virus is broad. Herpangina is classically due to Group A viruses. Aseptic meningitis, pleurodynia and neonatal myocarditis are well recognized expressions of Group B infection.

Most recently, pericarditis has been reported due to various Group B types, and combinations of pleurodynia, pericarditis, myocarditis, meningitis and orchitis are now being recognized.

Bibliography

1. Dalldorf, Gilbert, Melnick, J. L., and Curnen, E. C.: The Coxsackie virus group. *In* Viral and Rickettsial Diseases of Man. Philadelphia: J. B. Lippincott. 3rd Edition. 1959.
2. Sode, J., and Baker, W. J.: Acute benign pericarditis and pneumonitis; associated with Coxsackie virus group B, Type 2 infection in a young man. AMA Arch. Int. Med., 104:313, 1959.
3. Null, F. C., Jr., and Castle, C. H.: Adult pericarditis and myocarditis due to Coxsackie virus Group B, Type 5. New England J. Med., 261:937, 1959.
4. Syverton, J. T., McLean, D. M., da Silva, M. M., Doany, H. B., Cooney, M., Kleinman, H., and Bauer, H.: Outbreak of aseptic meningitis caused by Coxsackie B-5 Virus. J.A.M.A., 164:2015, 1957.
5. Gordon, R. B., Lennette, E. H., and Sandrock, R. S.: Varied clinical manifestations of Coxsackie virus infections: Observations and comments on an outbreak in California. Arch. Int. Med., 103:63, 1959.
6. McLean, D. M., Croft, C. C., Prince, J. T., and Heckman, E. E.: Coxsackie and ECHO infections in Ohio during 1956. Ohio M. J., 53:907, 1957.
7. Fletcher, E., and Brennan, C. F.: Cardiac complications of Coxsackie virus infection. Lancet, 1:913, 1957.
8. Weinstein, S. B.: Acute benign pericarditis associated with Coxsackie Group B, Type 5. New England J. Med., 257:265, 1957.
9. Movitt, E. R., Lennette, E. H., Mangum, J. F., Berk, M., and Bowman, M. S.: Acute benign pericarditis. New England J. Med., 258:1082, 1958.
10. McLean, D. M., Walker, S. J., and Bain, H. W.: Coxsackie B-5 virus in association with pericarditis and pleurodynia. Canad. M. A. J., 79:789, 1958.
11. Roberts, R., Lydon, M. B., and MacIntosh, M.: Coxsackie pericarditis. Canad. M. A. J., 80/9:722, 1959.
12. Bell, J. F., and Meis, A.: Pericarditis in infection due to Coxsackie virus Group B, Type 3. New England J. Med., 261:126, 1959.
13. Gillett, R. L.: Acute benign pericarditis and the Coxsackie viruses. New England J. Med., 261:838, 1959.
14. Kilbourne, E. D.: Coxsackie viruses and human disease. Am. J. M. Sc., 224:93, 1952.
15. Rhodes, A. J.: Recent advances in the laboratory diagnosis of virus infections. Ann. Int. Med., 45:106, 1956.

TABLE I. HISTOPLASMOSIS—102 CASES PROVED CULTURALLY AT MISSOURI STATE SANATORIUM

	Pos.	Neg.	Unknown
Complement-Fixation test	89	10	1
Histoplasmin Skin test	79	19	2

TABLE II. HISTOPLASMOSIS—52 CASES PROVED HISTOLOGICALLY AT MISSOURI STATE SANATORIUM

	Pos.	Neg.	Unknown
Complement-Fixation test	14	36	2
Histoplasmin Skin test	39	10	3

Diagnosis and Treatment of HISTOPLASMOSIS

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HISTOPLASMOSIS is a systemic fungus infection which resembles tuberculosis in many important respects. The infection is acquired by the inhalation of spores dispersed in the air from point sources in soil, particularly if contaminated with chicken, turkey, pigeon and bat droppings. The mycelial phase of the fungus occurs on laboratory cultures and in the soil, and the yeast phase in the tissues.[1,6,8] The majority of people who acquire the infection develop an acute benign type of disease which frequently is asymptomatic but may simulate influenza. Some of these patients will show a miliary type of x-ray picture and occasionally are admitted to tuberculosis sanatoria as having so-called "miliary tuberculosis."

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The incubation period of the acute benign disease varies from three days to three weeks, depending upon the intensity of exposure. Exposure during work such as cleaning or tearing down a chicken house may result in small epidemics in which several members of a family or group may develop different degrees of disease. The infection is not transmitted from man to man. Animals in the endemic areas also acquire the infection.[6,8,10]

In the endemic areas, the skin test is positive in a variable percentage of the general population. In Missouri, this includes approximately 80 per cent of the people. It has been estimated that approximately 30,000,000 people in the United States have been infected with *Histoplasma capsulatum*.[6,8] The vast majority of these persons have had the mild, so-called "primary" or acute benign disease, and seldom have symptomatology which requires medical care. Less than 1 per cent develop serious types of disease that will eventually require specific antifungal treatment. If only 0.5 per cent have serious types of the disease, this constitutes a significant medical problem. About 10 per cent of people being admitted to sanatoria in the highly endemic areas have clinically significant histoplasmosis.[9] There is a higher incidence of serious types of disease in men.

Complement-fixation tests and histoplasmin skin tests are useful screening procedures. The precipitin test is less sensitive than the complement-fixation but as applied with the gel-precipitin technique may be a more practical and rapid screening procedure.[1,2,3,5,8,10] As may be seen from Table I, 89 per cent of the culturally proved cases at the Missouri State Sanatorium have positive serology and 79 per cent, positive skin tests. If there is a complement-fixation titer of 1/8 or greater, careful cultural studies of sputum, bone marrow and blood should be performed. How long the complement-fixation titer remains elevated after an acute benign episode is not known. It is of interest to note (Table II) that only fourteen of forty-nine cases with histological proof of disease, but with negative cultures from sputum and resected tissue, have positive serology. This may be explained by considering the organisms demonstrated in such cases as dead or "ghosts." One-third of the patients with significant complement-fixation titers have been found to have active chronic pulmonary histoplasmosis. At least six sputum cultures are necessary for an adequate study.

The factors in the host-parasite relationship which lead to the development of serious types of disease are incompletely understood. Host nutrition undoubtedly plays a role, as well as age, and infecting dose. There are different strains of *Histoplasma capsulatum* as shown by cultural techniques and variance in sensitivity to specific antifungal agents. Although there is a broad clinical spectrum associated with progressive disease, disseminated histoplasmosis and chronic pulmonary histoplasmosis are the clinical types of major importance.[1,2,5,8,10,14]

Disseminated histoplasmosis should be suspected in patients with obscure fevers; lymph node, hepatic and splenic enlargements; and with a history of possible exposure. The diagnosis is materially aided by a positive skin test, a significant complement-fixation titer, and by culturing the bone marrow, the blood, and the sputum. The Cooperative Study Group on Mycoses of the U. S. Public Health Service recently reported a mortality of 80 per cent in a series of twenty-five untreated cases of disseminated histoplasmosis.[14]

The history of the patients with chronic pulmonary histoplasmosis resembles that of tuberculosis closely in that there is weight loss, recurrent fever, cough and hemoptysis, expectoration and gradual downhill course. The chest x-ray findings are practically identical. An infrequent patient with chronic pulmonary histoplasmosis will experience spontaneous remissions such as may be seen in tuberculosis. This is usually a fluctuation of exudative disease whereas the chronic components such as cavitation tend to persist. Tuberculosis co-exists with histoplasmosis in about 10 per cent of chronic pulmonary cases.[13] Physical findings are of relatively little help in this disease.

As is true of tuberculosis, cultural or histological demonstration of the organism is the major factor in diagnosis. All tissue obtained from patients

suspected as having a deep mycosis should be stained and cultured for fungi. The mucus in sputum interferes with the special stains, and digestion of sputum kills the organisms. Tissue that has been fixed in formalin for many years can still be sectioned and stained with special techniques to reveal the yeast bodies. The most useful stain is the Gomori modification of the methenamine silver stain. The Periodic Acid Schiff stain is helpful, but other structures in the tissues may react and cause confusion. The standard Hemotoxylin and Eosin stain is of little value. A useful rapid screening procedure is the use of polarized light microscopy.[8]

Recently, the co-operative study of the U. S. Public Health Service has reported on 85 untreated chronic pulmonary cases. Of these 74 per cent were either dead or physically disabled to the extent of 50 per cent or more at the end of an average of 3.6 years of followup.[14]

The differential diagnosis of this disease is important. The diseases that may be confused with it are sarcoidosis, tuberculosis, blastomycosis, actinomycosis, acute or chronic pneumonias, influenza, and many others, including cancer. The disease is a "great imitator." Mucocutaneous ulcers proven to be due to histoplasmosis indicate disseminated disease. The disease can produce pleurisy with effusion, bone and joint lesions, meningitis, gastric ulcers, diffuse lymphadenopathy, hepatomegaly, splenomegaly, chronic inflammatory renal disease, cold abscesses, and adrenal insufficiency.

In summary, a few pertinent points regarding diagnosis should be emphasized. A history of exposure, such as living in a highly endemic area, is helpful but lack of this doesn't exclude the disease. The disease resembles tuberculosis closely but if tuberculosis has been excluded, cultural studies for *Histoplasma capsulatum* should be done on sputum, blood, and bone marrow. Multiple cultures are essential. Complement-fixation and skin tests are useful screening tests but when negative do not rule out the disease in the individual patient. If the complement-fixation test is positive, this is helpful, but demonstration of the organisms by cultural or histological techniques is essential to an accurate diagnosis. Investigation of other members of the family or group may prove helpful. Culturing the organism from a possible source of exposure is also helpful. All tissue from patients with suspected histoplasmosis should be carefully studied by suitable cultural and histological techniques. Lastly, as with many diseases, a high index of suspicion is a definite asset.

The cornerstones of medical management are those which are of value with tuberculosis; that is, rest, adequate nutrition, and specific chemotherapy.[8] A rare patient with chronic pulmonary disease will improve on rest and good nutrition alone. In chronic pulmonary or disseminated disease, the mortality and progression rates are so high that specific therapy is necessary.

A period of observation may be necessary to determine activity. In the management of acute benign cases, an observation period of two to four weeks is advisable to determine if the disease will subside without specific drug treatment. The criteria used in deciding on specific antifungal treatment are: the presence of cavitation, positive sputum, x-ray progression; evidence of disseminated disease, such as palpable spleen, positive blood and bone marrow cultures; mucocutaneous ulcers; a progressive downhill course; high fever; severe cough; hemoptysis; positive urine cultures; and positive cultures from resected tissue. Rarely, a patient with acute benign disease, which is subsiding slowly, may be given specific treatment to speed recovery.

Amphotericin B* is the best antifungal agent that is currently available.[4,7,8,12,13] Amphotericin B is a polyene antibiotic produced by a streptomyces isolated from a soil sample taken from along the Orinoco River in South America. It is relatively insoluble and is not absorbed from the gastrointestinal tract. It must be given by the intravenous route in a dilute solution. Treatment is begun with 25 mgm. in 500 to 1000 cc. of 5 per cent glucose in water, administered slowly over a six-hour period. The daily dosage is increased by increments of 5 mgm. as tolerated until a total daily dose of 1 mgm. per kilogram of body weight is reached. The frequency may then be decreased to three times a week.

Side effects such as chilling and fever, headache, anorexia and some nausea are frequent and annoying but not dangerous. Tolerance rapidly develops and these are relatively mild in the majority of cases. These reactions can be controlled by the exhibition of acetylsalicylic acid and adrenoster-

*Squibb's Fungizone.

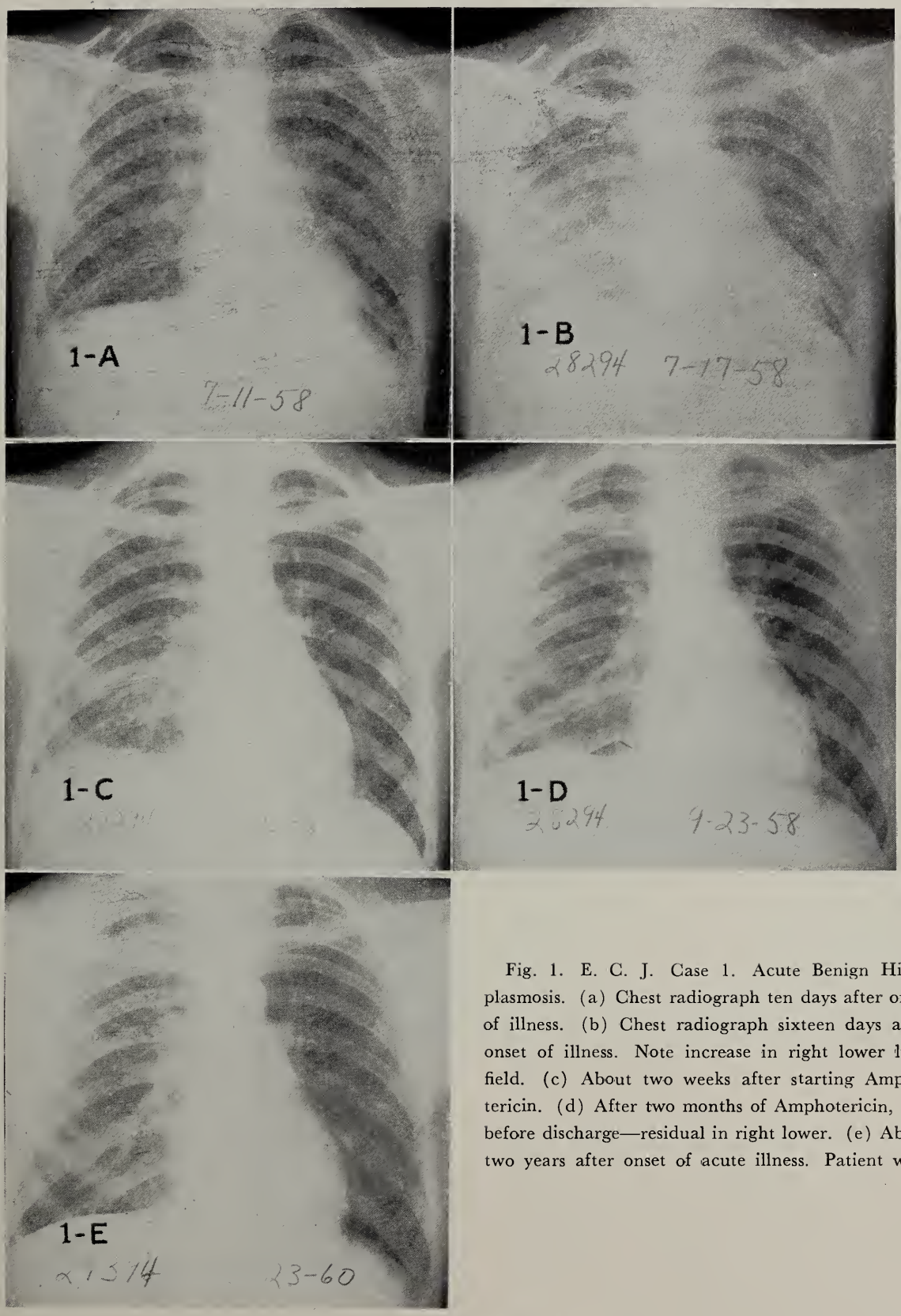


Fig. 1. E. C. J. Case 1. Acute Benign Histoplasmosis. (a) Chest radiograph ten days after onset of illness. (b) Chest radiograph sixteen days after onset of illness. Note increase in right lower lung field. (c) About two weeks after starting Amphotericin. (d) After two months of Amphotericin, just before discharge—residual in right lower. (e) About two years after onset of acute illness. Patient well.

oids. The steroids may be administered intravenously in the same fluid as the Amphotericin. Elevation of the blood urea nitrogen (BUN) may occur later in the course of therapy. This may be helped by forcing fluids and occasionally by decreasing dosage in these patients. If the BUN does not go above 40, treatment may be safely continued. Two to four weeks after discontinuance of Amphotericin, the BUN returns to normal. This BUN elevation is apparently due to a direct effect of the drug on the kidney. The phenolsulfonphthallien excretion and the urea clearance are also impaired. An occasional patient will experience a transient periphlebitic inflammatory reaction which is easily controlled by administering adrenosteroids and heparin in each intravenous treatment. It is advisable to avoid using the same vein on consecutive treatment days. Rashes have been observed. Hypersensitivity angiitis with polymyositis has occurred infrequently. The agent is an antibiotic and therefore hypersensitivity must be expected. Mild hypochromic anemias may develop, particularly in patients with elevated BUN. These usually respond to iron therapy.

The optimal duration of treatment is unknown. However, it should be continued for a period of at least four months and even then discontinuance in severe disease may result in relapses. Usually, the sputum cultures become negative within a two-to-four week period. Clinical improvement with decrease of sputum, cough, and some improvement by x-ray occurs more gradually beginning within a two-month period. X-ray improvement is much slower and less striking than the clinical and sputum improvement. Apparently, the longer Amphotericin therapy is continued, the less likely relapses will occur. A relatively high percentage of sputum, x-ray and clinical relapses occurs if treatment is discontinued at eight weeks or less. Relapses are observed even after five to six months of Amphotericin therapy, particularly if large amounts of necrotic debris persist.

Because this treatment must be considered primarily suppressive, surgery plays an important part in the management of chronic pulmonary histoplasmosis. Surgery is usually considered at the eight-to-twelve week period of Amphotericin therapy. Amphotericin should be continued for at least two to four weeks after surgery.

The patient tolerance of this treatment is poor due to the prolonged intravenous courses necessary, the side effects, and the slow x-ray response. The rapport between the doctor and the patient plays an extremely important part in continuing the treatment.

Other drugs are being tested but these are not too promising as yet. Adrenal insufficiency must be kept in mind and suitable therapy instituted when indicated.

Two case histories and reproductions of selected radiographs are included here to illustrate some of the points discussed above.

Case Histories

Case 1.—E. C. J., a seventeen-year-old white farm youth, was well until a sudden onset of chills, fever, cough, malaise, anorexia one week after assisting his father and another man in cleaning a chicken house. The two men were also ill but for a much shorter time and less severely. The family history is negative for tuberculosis. In spite of penicillin, the boy continued to cough, have fever, malaise, weight loss, and developed pleuritic pain in the right lower chest.

On admission to the Missouri State Sanatorium two weeks after onset of symptoms, he appeared obviously toxic and malnourished, with fever up to 103°. The physical examination was otherwise normal except for some lag, impaired resonance and depressed breath tones over the lower right chest. Lymph nodes, liver and spleen were not remarkable.

Laboratory Findings.—Abnormal and pertinent negatives only—WBC 15,000, 66 per cent polys with left shift; blood count otherwise normal and urinalysis negative. Repeated cultures of sputum, bone marrow, and blood for *Histoplasma capsulatum* and M. Tuberculosis negative. The histoplasma complement-fixation was negative on admission but became positive eighteen days after admission with mycelial antigen of 1/16 and yeast phase antigen of 1/128. Subsequently, the yeast phase titer rose to 1/256 and the mycelial phase antigen was 1/8. Repeated intermediate and second strength PPD skin tests were negative. (Boy's father—positive Histoplasmin complement-fixation and skin test.) Histoplasmin skin test—induration 16 mm., erythema 18 mm., positive.

Hospital Course.—Because of the continued severe febrile illness and increasing x-ray findings (Fig. 1) and negative tuberculins, Amphotericin B intravenously was begun two days after admission and continued for two months after which the patient was discharged to continue to rest at home for three months more before returning to school full time. He improved remarkably within a seven-day period (Fig. 1—rapid x-ray improvement). At the time of the last chest radiograph on June 23, 1960, he was completely well.

Comment.—This illustrates a severe type of acute benign disease with perhaps a speeding of recovery by Amphotericin therapy.

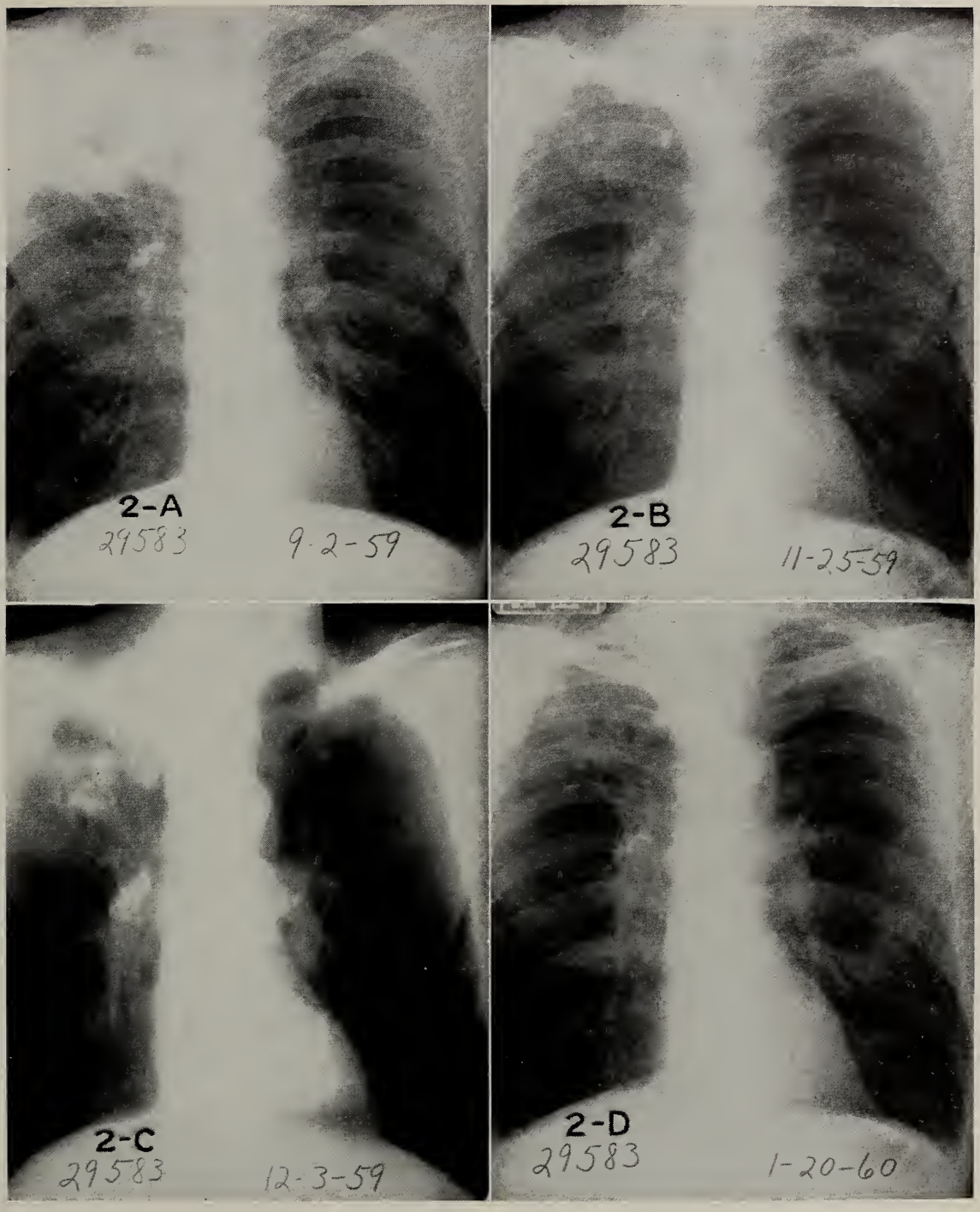


Fig. 2. H. L. H. Case 2. Chronic Pulmonary Histoplasmosis. (a) Posteroanterior chest radiograph one month before beginning Amphotericin. (b) Posteroanterior chest radiograph after one and one-half months of Amphotericin. Residual cavitation. (c) Planigram approximately two and one-half months of Amphotericin B. (d) Posteroanterior chest radiograph one day before right upper lobectomy.

Case 2.—H. L. H., a white farmer, aged fifty-nine, with a negative family history for tuberculosis, was admitted to the sanatorium after a two-month history of a "flu-like" illness with recurrent fever, malaise, cough, purulent expectoration and weight loss of 20 pounds. A chest radiograph was interpreted as showing "pulmonary tuberculosis." The past medical history revealed typhoid fever as a child, previous ulcer symptoms, transient jaundice three years before without recurrence.

The systemic review was noncontributory.

The physical examination was normal except for malnutrition.

Laboratory Findings.—Normal CBC, urinalysis, and fasting blood sugar. Numerous sputum studies for tuberculosis (smear and culture) all negative. BUN, serum bilirubin, BSP, cephalin flocculation and thymol turbidity all normal, albumin 4.4 gm., globulin 3.3 grams. Nine sputum cultures positive for *Histoplasma capsulatum*. Intermediate PPD positive. Histoplasmin skin test positive. Complement-fixation test—mycelial 1/16, yeast 1/64 on admission remained positive on numerous tests with gradually decreasing titer and became negative immediately after right upper lobectomy.

Course in Hospital.—Patient was observed on modified bed rest for five weeks, and then intravenous Amphotericin was begun. He experienced mild fever and chilling at first and later BUN elevation to 26.3 mgm. per cent. Sputum decreased within one month to almost nothing, patient's fever disappeared within two weeks. As may be seen in Figure 2, the chest radiograph revealed remarkable improvement, but residual cavities persisted. A right upper lobectomy was performed after three and one-half months of Amphotericin therapy. The sputum findings became repeatedly negative two weeks after initiation of Amphotericin and remained so for a total of eighteen negative cultures up to the time of discharge about three weeks after surgery and one week after discontinuance of Amphotericin. At time of discharge, the patient was apparently well. He was to increase his physical activity gradually and return to work six months after discharge. A follow-up radiograph (not shown) two months after discharge revealed excellent result. The surgical specimen revealed atelectasis, a 2 cm. cavity and several small inspissated cavities. Methenamine silver stains were positive but cultures from the resected tissue were negative.

Comment.—This illustrates the management of a patient with chronic pulmonary histoplasmosis with Amphotericin therapy and surgical resection with a fine result.

Summary

Histoplasmosis is an important medical problem. As with tuberculosis, the diagnosis rests on the demonstration of the organism by cultural or histological techniques.

Rest, good nutrition, and specific antifungal chemotherapy are cornerstones of medical management of serious types of disease such as chronic pulmonary and disseminated histoplasmosis. Amphotericin B is the best specific therapy available at present, but it is primarily suppressive. Patient acceptance of Amphotericin B therapy is only fair. When feasible, excision of narcotic debris under an Amphotericin "umbrella" will decrease the relapse rate significantly.

References

1. Rubin, H., et al: The course and prognosis of histoplasmosis. Am. J. Med., 27:278 (Aug.) 1959.
2. Furcolow, M. L., and Rubin, H.: The clinical recognition and treatment of histoplasmosis, blastomycosis and cryptococcosis. Tr. 5th Internat. Congress Dis. Chest. Tokyo: P. 252 (Sept.) 1958.
3. Larsh, H. W.: Modern laboratory methods in the diagnosis of systemic mycoses. Ibid, p. 260.
4. Lehan, et al: Experiences with the therapy of sixty cases of deep mycotic infections. Dis. Chest, 32:597, 1957.
5. Lehan, P. H., Brasher, C. A., Larsh, H. W., and Furclow, M. L.: Evaluation of clinical aids to the diagnosis of chronic progressive cavitary histoplasmosis. Am. Rev. Tuber., 75:938 (June) 1957.
6. Schwarz, Jan, and Furcolow, M. L.: Some epidemiologic factors and diagnostic tests in blastomycosis, coccidioidomycosis and histoplasmosis. Am. J. Clin. Path., 25:261 (March) 1955.
7. Procknow, J. J., and Loosli, C. G.: Treatment of deep mycoses. AMA Arch. Int. Med., 101:75, 1958.
8. Sweany, H. C.: Histoplasmosis. Springfield, Ill.: Charles C Thomas, 1960.
9. Furcolow, M. L., and Brasher, C. A.: Chronic progressive (cavitary) histoplasmosis as a problem in tuberculosis sanatoria. Am. Rev. Tuberc., 73:609, 1956.
10. Silverman, T. N., Schwarz, Jan, Lakey, M. E., Carson, R. P.: Histoplasmosis. Am. J. Med., 19:410, 1955.
11. Curry, T. J., and Weir, J. A.: Histoplasmosis. Am. Rev. Tuberc., 77:749, 1958.
12. Seabury, J. H., and Dascomb, H. E.: Experience with Amphotericin B for the treatment of systemic mycoses. AMA Arch. Int. Med., 102:906 (Dec.) 1958.
13. Yates, J. L., Atay, M. N., Langeluttig, H. V., Brasher, C. A., and Furcolow, M. L.: Experiences with Amphotericin B in the therapy of thirty cases of histoplasmosis. Dis. Chest, 37:144, 1960.
14. U. S. Public Health Service: Presentations of data from the U. S. Public Health Service Cooperative Study on Mycosis at the American Trudeau Society meeting in Los Angeles, May, 1960.

Surgical Treatment of HISTOPLASMOSIS with Case Reports

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PULMONARY histoplasmosis, an isolated phase of generalized histoplasmosis, was considered a rare disease in 1945. Even though the organisms has been isolated in 1934[1] from a clinical case, the clinical manifestations and pathogenesis of this disease were not fully described. Chronic progressive histoplasmosis has been described by Bunnell and Furcolow[2] and Johnson and Batson[3] in 1958 with Sutliff and his co-workers[4] later presenting cases comparable to this. Focalized pulmonary histoplasmosis was presented by Forsee and his co-workers in 1953.[5] We presented two groups of cases in 1956[6] and 1957,[7] attempting to show that pulmonary histoplasmosis can mimic almost any disease which is encountered in the lungs and that in most of these cases, pulmonary histoplasmosis cannot be ruled out without finding the etiologic agent *Histoplasma capsulatum*. In our two previous reports, we also stated that we believed pulmonary resection offered an adequate method for treatment in selected cases. It is the

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purpose of this paper to reiterate our indications for pulmonary resection and to comment on our experiences with Amphotericin B in the treatment of several cases undergoing surgical resection after having been administered this drug.

Indications for Resection

We had previously commented that two considerations were of utmost importance when considering the treatment of pulmonary histoplasmosis: (1) that establishing the diagnosis of pulmonary histoplasmosis may be long and tedious; (2) that if the patient has not localized his disease to a portion of the lung, the prognosis, up until recently, has been very poor. If these factors are realized surgical resection alone or with the coverage offered by Amphotericin B seems to offer excellent therapy with certain forms of this disease.

Due to the paucity of cases reported (excluding focalized coin lesions), the indications for resection are not too clear. We have utilized many of the indications which were established in the surgical treatment of pulmonary tuberculosis as a guide to our selection of cases with histoplasmosis.

Indications for Surgery

1. Coin lesions
2. Large solid mass (over 6 cm. in diameter)
3. Right middle lobe syndrome
4. Bronchiectasis
5. Bronchial stenosis
6. Acute lung abscess
7. Destroyed lung
8. Empyema with or without bronchopleural fistula
9. Cavitary histoplasmosis

Discussion

Resection of localized histoplasmosis usually occurs because a definite diagnosis cannot be established. Since it has been definitely shown that bronchogenic carcinoma is indistinguishable from this, exploratory thoracotomy and surgical removal is mandatory. Because of the fact that approximately 30 per cent of these patients will have tuberculomas, the activity of which is unknown, and because the two diseases can occur in the same coin lesion, we prefer to put these patients on antituberculosis therapy at least five days prior to their removal. On this routine, we have had no spread of the pulmonary histoplasmosis or tuberculosis.

The large solid mass mentioned above is a fairly rare form of this disease. When such masses occur, they are completely indistinguishable from a bronchogenic carcinoma. Bronchoscopy has been of no value in aiding with a diagnosis of histoplasmosis in this form of the disease. In all our cases, the diagnosis was established after lobectomy. It is worth noting that at the operating table these lesions feel hard and are most commonly located in the center of a lobe.

The right middle lobe syndrome is usually diagnosed from the history, complement fixation tests, and histoplasmin skin tests. In none of these cases have we been able to isolate the organism from the sputum prior to surgery, and the surgery is often performed several months or years after the active process has subsided. As in other diseases producing the middle lobe syndrome, histoplasmosis is caused by the extensive lymph node involvement around the bronchus.

Histoplasmic bronchiectasis seems to be a fairly rare disease also, excluding the bronchiectatic right middle lobe which occurs with the syndrome. In the cases in which we have done resection, the diagnosis has not been made prior to surgery, resection having been proposed because of extensive saccular bronchiectasis. It is worth noting from the history of two of these patients, however, that hemoptysis was a chief complaint, and in both of them the amount of hemoptysis was over twenty ounces. In the future, we would suspect this disease in a patient having extensive bronchiectasis with large recurrent hemoptysis and a

strongly positive histoplasmin skin test.

We have been able to demonstrate only one case with true bronchial stenosis as a result of this disease compared to numerous reported cases of stenosis with tuberculosis as the etiologic factor. A case report will be given.

Acute lung abscess was not in our list of indications for surgical resection until the past year. Prior to this, we had considered that other organisms were responsible for the abscess and that *Histoplasma capsulatum* was a contaminant. Because of several cases in which we have done resection and from which only that organism could be cultured, we have included it in this list. We have also considered this in our preoperative diagnosis on patients in whom we have been unable to culture any specific organism and in whom there has been no demonstrable improvement after extensive broad spectrum antibiotic therapy. Lobectomy appears to be the procedure of choice in this group of cases.

Destroyed lung is listed in our series of cases for two reasons: (1) the lung may be destroyed by histoplasmosis alone although this appears to take several years with the progressive form of this disease; two cases, however, have been subjected to pneumonectomy where the disease appeared to be acute and pneumonic in type; (2) resection has been done in several cases with destroyed lung from which both acid-fast organisms and the organism *Histoplasma capsulatum* were cultured. In three of these cases, the diagnosis of pulmonary tuberculosis had been made alone because of positive sputum prior to resection.

Histoplasmic empyema, with the organism *(Histoplasma capsulatum)* having been cultured from the empyema fluid, is rare. In only two cases have we been able to prove this. In one case, the empyema occurred following a destroyed lung with bronchopleural fistula. In the second, the empyema was localized to the right lower lobe area. A bronchopleural fistula was also demonstrated in this case. Treatment of this would appear to us to vary with the selection of cases.

Cavitary pulmonary histoplasmosis is the most frequent form of this disease for which we have performed surgical resection. Prior to the advent of the antifungal agents, we had advocated lobectomy for this type of disease. With the use of Amphotericin B, however, our concept has changed, and we are able to list several factors which we believe are important prior to surgical resection for the cavities.

First, it is with the cavitary form of the disease that the organism is most frequently and easily demonstrated. Thus, a diagnosis of histoplasmosis can be definitely established before resection. When this occurs, we believe that we are justified in treating the patient with Amphotericin B prior to surgical resection even though there are numerous side effects to this drug. We also believe it is worthwhile waiting for the sputum to be converted to a negative phase by this form of treatment. This form of treatment appears to cause regression in the infiltrative process surrounding the cavitary component. It has been our experience, however, that in the chronic, cavitary phase of this disease that this drug alone will not close cavities over 3 or 4 cm. in diameter. In none of the cases which had Amphotericin B prior to resection has there been a spread of the disease demonstrable following surgery.

Several case reports concerning this form of disease will be given and a case report which had a spread ten months postoperatively will also be included. This case with the spread did not have Amphotericin B coverage at the time of initial resection.

Case Reports

Case 1 (Large solid mass).—A white man, aged fifty-nine, was admitted to the Missouri Sanatorium on December 12, 1956. He stated that he had had several colds in the winter of 1955 and 1956, developing productive cough five months prior to admission. In the fall of 1956, he developed severe pain in the right chest, and a roentgenogram revealed a dense mass in the right upper lung field. He was admitted to the Missouri State Sanatorium by his local physician, believing that

this mass represented a carcinoma or tuberculous process.

Past history was negative. Physical examination was non-contributory.

The vital capacity was 5,017 cc. and maximum breathing capacity 124 liters per minute. Routine sputum examinations included cultures negative for AFB. The histoplasmin skin test was strongly positive and the tuberculin skin test was negative. Bronchoscopy was performed on December 14 and all studies wese negative for malignant cells and acid fast organisms. On December 20, right upper lobectomy was performed. Frozen section at the time of surgery failed to reveal a malignant lesion. After a relatively uneventful postoperative course, he was discharged on January 16, 1957 to resume his normal occupation. PAS stain and methenamine silver stains of the resected lung tissue revealed *Histoplasma capsulatum*.

(In several cases which we have seen such as this, it was necessary to perform lobectomy prior to making diagnosis).

stenosis of the right upper lobe bronchus. Smears from this area were negative for malignant cells.

Right upper lobectomy was performed on October 20. Patient was discharged October 27 after an uneventful postoperative course. Pathological sections of the lung showed a multiloculated cyst, the largest measuring 6 cm. in diameter. From this larger cyst were numerous connective openings to smaller cysts. Section of the upper lobe bronchus showed it to be obstructed and completely obliterated by fibrous tissue. Unfortunately, cultures of the resected specimen were not done for fungi. PAS stain and methenamine silver stain, however, revealed numerous organisms which were identified as Histoplasma capsulatum.

The patient has now been followed for over four years and has had no recurrence of his histoplasmosis. Seriological studies for histoplasmosis have been negative since six months after surgery. Histoplasmin skin test remains strongly positive however. The patient has returned to his normal occupation as a truck driver.

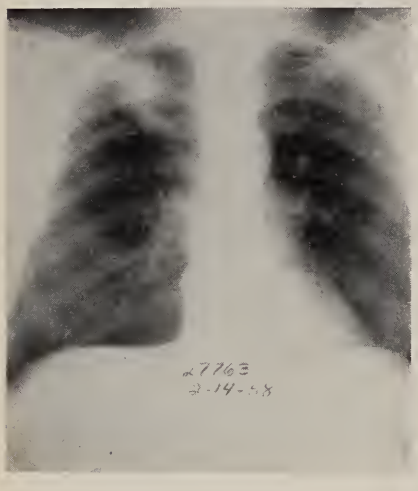


Fig. 1. Case 1. A white man, aged fifty-nine, large solid lesion.

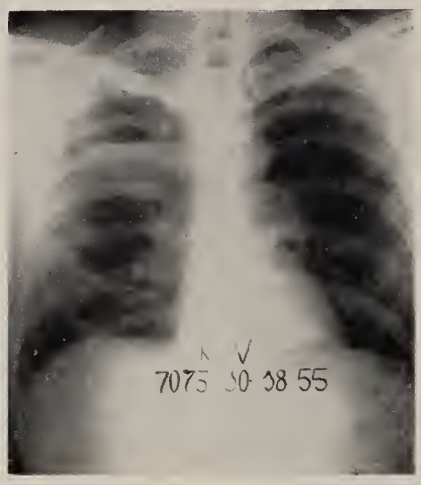


Fig. 2. Case 2. A white man, aged thirty-nine, with large cystic cavities and bronchial stenosis. (Used by permission of *Journal of Thoracic Surgery*, C. V. Mosby Company).



Fig. 3. Case 3. A white man, aged fifty-one, destroyed right lung. (Used by permission of Chas. C Thomas. Publisher, from the book "Histoplasmosis" by H. C. Sweany, M.D., No. 486).

Case 2.—A white man, aged thirty-nine, had been seen on October 18, 1955 at Burge Hospital, Springfield, dyspnea and malaise were also noted. Even though the Missouri. He stated that in September, 1955, he had developed severe cold, pain in the right chest, and sensation of pressure in the right chest. Exertional above symptoms persisted, he worked until October 15. Roentgenogram at this time revealed a large cystic lesion containing fluid in the right upper lung field.

Past history was non-contributory.

Physical examination revealed fine moist rales over the right upper lung field. Blood pressure was 176/70. Complete blood studies were normal. Histoplasmin skin test was strongly positive. Tuberculin skin test was negative. Several sputum examinations were reported negative for acid fast organisms. Bronchoscopy revealed

Case 3.—A white man, aged fifty-one, was admitted to the Missouri State Sanatorium on January 3, 1958, stating he had felt well until December, 1957, when he was diagnosed as having influenza. At this time, he had severe cough, shortness of breath, and raised thick yellow sputum. He denied hemoptysis. He also stated that he had lost approximately 20 pounds of weight in the past three months. Symptoms continued. After a radiograph of the chest was made, he was admitted to the Missouri State Sanatorium.

Past history was noncontributory.

Physical examination revealed an emaciated, acutely ill, white man, who appeared to be short of breath. There were moist rales over the right upper lung field and and there was a wheezing over the right upper lung field. Remainder of the physical was noncontributory. CBC and urinalysis were normal. The tuberculin skin

test was negative. Histoplasmin skin test was positive. Sputum cultures were negative for AFB but repeatedly positive for Histoplasma capsulatum.

Bronchoscopy was done on January 21 and revealed redness of the bronchial mucosa on the right. After the diagnosis of histoplasmosis had been established by repeated sputum cultures, the patient was placed on Amphotericin B. Therapy was given three times weekly until the maximum of 65 mgm. had been reached. On this medication, his cough improved but his sputum never converted to the negative status. On May 6, right pneumonectomy was performed because of destroyed right lung. The only areas not involved were the basal segments which were markedly emphysematous and over-distended. Following pneumonectomy, the patient's sputum was continuously negative for *Histoplasma capsulatum* and Amphotericin B was continued until his discharge on May 28.

This patient did extremely well until October 2, when he developed a pneumonia in the left lung and he expired at the University Hospital, Columbia, Missouri, on October 30, 1958. Autopsy revealed lobar pneumonia, left lower lobe, and one small fibrocaseous nodule in the left lung in which the organism Histoplasma capsulatum was demonstrated on special stain.

This is one of the few cases in which the sputum did not convert to the negative status on Amphotericin B therapy.

Case 4.—A white man, aged fifty-nine, was admitted to the Missouri State Sanatorium on January 28, 1958, with chief complaint of shortness of breath and pain in the chest. He had had numerous x-rays prior to this at various hospitals and had never been found to have pulmonary disease. Radiograph taken in early August, 1958, showed bilateral infiltration and cavitation and the patient was admitted to the sanatorium.

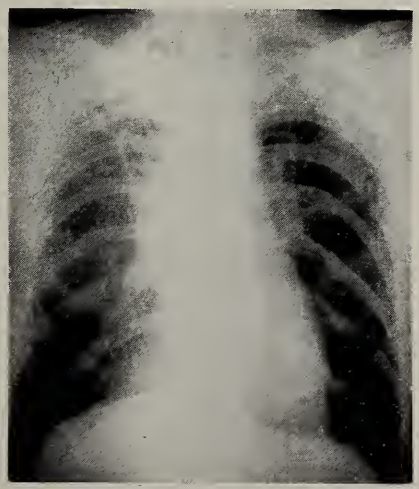


Fig. 4. Case 4. A white man, aged fifty-nine, bilateral cavitation, histoplasmosis and tuberculosis.

At the sanatorium, both the tuberculin and histoplasmin skin tests were strongly positive. Repeated cultures of the sputum were positive for acid fast organisms and Histoplasma capsulatum. The patient was placed on streptomycin, 1 gram daily, INH, 100 mgm. tid, and PAS, 12 grams daily. He also received Amphotericin B from March 30, 1959 to July 29, 1959, intravenously three times weekly.

On the above regimen, the sputum became negative for both acid fast organisms and Histoplasma capsulatum. On August 3, because of persistent cavitation in the right apex, an apical posterior segmental resection was performed. The patient had an uneventful postoperative course and was discharged November 17, 1959, receiving antituberculous therapy. No Amphotericin B was utilized postoperatively.

This case demonstrates how both tuberculosis and histoplasmosis mimic each other and at times both diseases will have to be treated concomitantly.

Conclusions

Pulmonary histoplasmosis may mimic any disease which occurs in the lung. This is especially true when paralleling the course of this disease with the pathological processes of tuberculosis. That the two diseases occur simultaneously has been well documented.

In selected cases, pulmonary resection offers an excellent method in the treatment of chronic pulmonary histoplasmosis. We believe Amphotericin B will prevent spreads postoperatively, and it is possible, in the future, that patients who have been denied surgical therapy may become candidates for this definitive type of treatment.

Bibliography

1. DeMonbreun, W. A.: The cultivation and cultural characteristics of Darling's Histoplasma capsulatum. Am. J. Trop. Med., 14:93, 1934.
2. Bunnell, I. L., and Furcolow, M. L.: A report of ten proven cases of histoplasmosis. U. S. Pub. Health Rep., 63:299-315, 1948.
3. Johnson, H. E., and Batson, R.: Benign pulmonary histoplasmosis. A case report with brief review of literature. Dis. Chest, 14:517, 1948.
4. Sutliff, W. D., Hughes, F. A., Ulrich, E., and Burkett, L. L.: Active chronic pulmonary histoplasmosis. AMA Arch. Int. Med., 92:571, 1953.
5. Forsee, J. H., Puckett, T. F., and Hagman, F. E.: Surgical considerations in focalized pulmonary histoplasmosis J. Thoracic Surg., 26:131, 1953.
6. Polk, J. W., Brasher, C. A., de Castro, J., and Buckingham, W. W.: The surgical treatment of pulmonary histoplasmosis with an evaluation of MRD-112 as a possible adjunct. J. Thoracic Surg., 31:148-162, 1956.
7. Polk, J. W., Cubiles, J. A., and Buckingham, W. W.: The surgical treatment of chronic progressive pulmonary histoplasmosis. J. Thoracic Surg., 34: 323-341 (Sept.) 1957.

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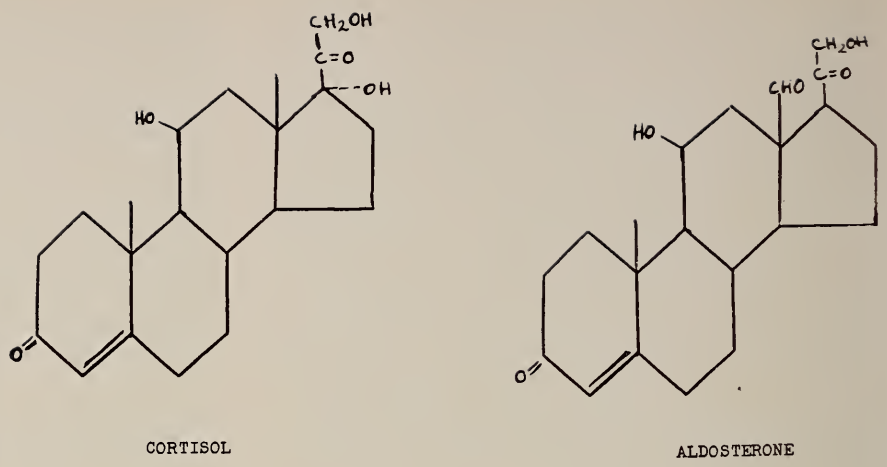


Fig. 1. The most important corticosteroids secreted by the human adrenal cortex, cortisol and aldosterone. Note the absence of a hydroxyl group on C_{17} and addition of an aldehyde group on C_{18} on the aldosterone molecule.

ANIFESTATIONS of adrenocortical dysfunction are usually obvious. Laboratory confirmation consists in the demonstration of abnormal adrenocortical hormone production. Nonspecific tests may not be relied upon consistently so that decisions regarding surgical extirpation of the adrenals and/or lifetime hormone replacement must rest firmly on measured alterations of blood hormone concentrations and/or urinary metabolite excretion. Specific assessment is essential in the so-called "borderline" disorders. Representative of these conditions are obese women with hirsutism, hypertensive plethoric individuals with diabetes and adolescents with truncal obesity and striae. The examples cited are commonly encountered and present certain features suggesting adrenocortical hyperfunction.

A number of individuals with renal salt wasting, hypotension and hyperpigmentation are virtually indistinguishable from patients with classical Addison's disease. On the other hand, a number of patients have been reported whose appearance is normal but who manifest acute adrenocortical insufficiency when subjected to stress.

Over the past fifteen years, intensive efforts to apply methods for estimation of adrenocortical hormone production has been made. A few of these methods are suitable for routine laboratory use. This report will confine itself to the application and interpretation of some of these procedures.

Chemical and Physiological Considerations

Some 46 steroids have been isolated from adrenocortical tissue or adrenal venous effluent. Most have not been found in adrenal vein blood and thus represent precursors or metabolic transformation products.

Corticosteroids—C-21 steroids with three or more oxygen atoms. These are formed exclusively in the adrenals.

Progestins—C-21 steroids with less than three oxygen atoms having progestational activity.

Androgens—C-19 steroids with an oxygen atom of C-17 (17-oxo- or 17-ketosteroids and precursors) having androgenic activity.

Estrogens—C-18 steroids with estrogenic activity.

From the Department of Medicine, University of Arkansas Medical Center, Little Rock, Arkansas, Dr. Melby is Assistant Professor of Medicine and Biochemistry at the University of Arkansas.

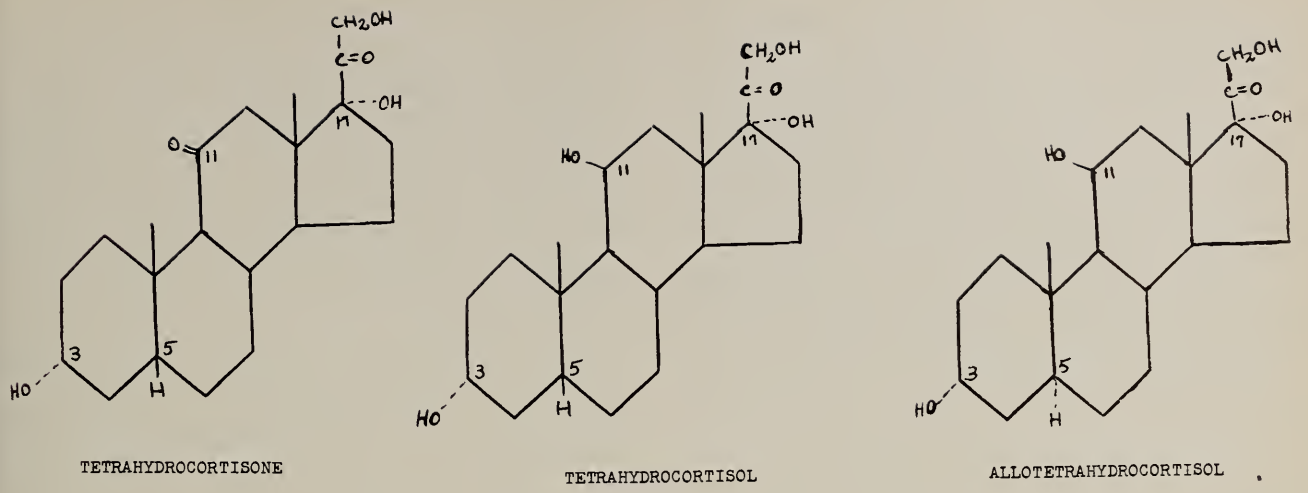


Fig. 2. Urinary metabolites of cortisol which retain the dihydroxyacetone side chain at C_{17} and give a positive Porter-Silber reaction (17-OHCS).

The Corticosteroids

Two corticosteroids (C-21), cortisol and aldosterone, account for most of the biological activity of the adrenal cortex (Fig. 1).

Cortisol is the predominant corticosteroid product of the normal human adrenal cortex.[1] It is anti-inflammatory and a regulator of "organic" metabolism (protein and carbohydrate) hence is referred to as a glucocorticoid. It circulates in the blood in a concentration of from 4-30 micrograms/100 ml. plasma. The plasma concentration of cortisol follows a definite diurnal rhythm with a peak in the morning and trough in the evening. The daily production of cortisol averages approximately 20 mg. A continuous infusion of corticotropin (ACTH) results in a maximal peripheral blood concentration of cortisol within four hours which thereafter remains constant for the duration of the infusion. Such maximal constant stimulation results in the production of 150-250 mg. of cortisol and cannot be further augmented by increasing the dose of corticotropin.[2] The average daily production rate of cortisol agrees with the replacement requirements of Addisonian and of totally adrenalectomized patients amounting to 20 to 30 mg. per day.

Cortisol is enzymatically inactivated in the liver by reduction to a number of metabolites which are rapidly conjugated with glucuronic acid to form water-soluble glucuronides which are excreted in the urine.

The 17-Hydroxycorticosteroids (17-OHCS)

Two major groups of metabolites are measured by methods currently employed in the clinical laboratory. In the first group reduction of the first ring of the steroid nucleus occurs without alteration of the C-17 side chain. These cortisol metabolites are known as Porter-Silber chromogens or 17-hydroxycorticosteroids (17-OHCS). The C-17 side chain reacts with phenylhydrazine to form a yellow compound which is easily measured.[3] It is this reaction which has enjoyed the widest clinical usage, as both cortisol in plasma and urinary metabolites may be measured. These compounds in urine (tetrahydrocortisone, tetrahydrocortisol and allotetrahydrocortisol) account for 20 to 30 per cent of the urinary metabolites of cortisol (Fig. 2).

The 17-Ketogenic Steroids

The second group of metabolites (20-40 per cent) (cortols and cortolones) are reduced as described above but, in addition, the C-20 carbonyl

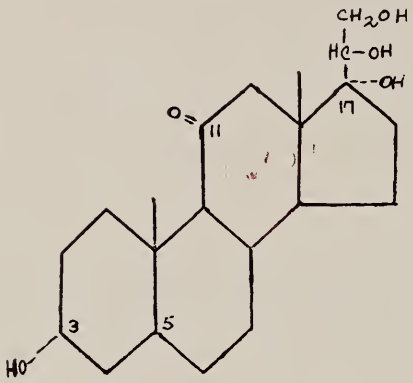
group is reduced to form a C-17 glycerol side chain (Fig. 3).

When both groups of metabolites are treated with sodium bismuthate, the C-17 side chain is oxidized to form 17-ketosteroids. Norymberski first applied this procedure[4] and referred to these steroids as 17-ketogenic (17-KGS).

In the Norymberski procedure for 17-KGS, the Zimmerman reaction[5,6] is employed for 17-ketosteroids (17-KS) using m-dinitro-benzene to form a violet colored compound.

The Electrolyte-Active Hormone

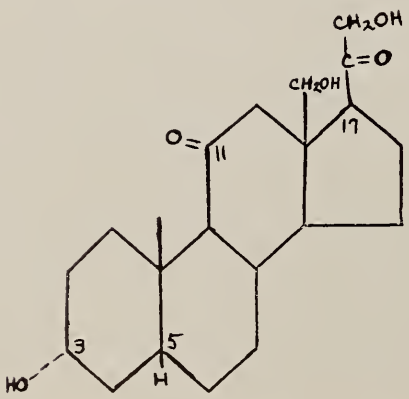
Aldosterone is the most potent hormonal regulator of sodium and potassium metabolism and is secreted at a rate of 150-300 micrograms per day. Its plasma concentration varies from 0.04 to 0.08 micrograms/100 ml. Aldosterone secretion is stimulated by a reduction of intravascular fluid volume, potassium loading and transiently with ACTH. Aldosterone stimulating hormone (glomerulotropin) is a lipid complex originating in the posterior hypothalamus, possibly the pineal gland and subcommissural body.[7]



β-CORTOLONE

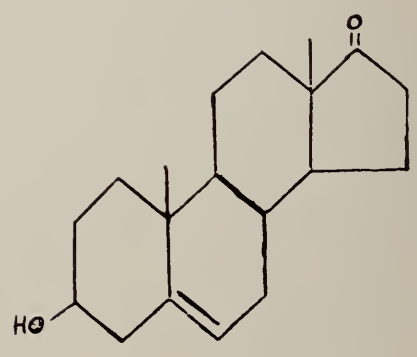
Fig. 3. B-cortolone is the predominant cortisol metabolite having a glycerol side chain at C_{17}. It does not give a positive Porter-Silber reaction but is included in the 17-KGS.

At the present time, all methods for the measurement of aldosterone or its metabolites in the urine are tedious because partition chromatography on filter paper using at least three solvent systems is required. The method of Neher and Wettstein[8] or a suitable modification is generally employed for a fraction representing 5 to 10 per cent of the daily production. Interestingly, the "pH 1-3-oxo-conjugate" is biologically active. The possibility of a simpler method was suggested by the isolation of a "tetrahydro" metabolite by Ulick, Laragh, and Lieberman.[9] A method for the chemical estimation for the "tetrahydro" metabolite of aldosterone has been successfully applied to urine in this laboratory.[10] It has been possible to extract this substance after glucuronidase hydrolysis from as little as a 50 ml. aliquot of urine and apply the residue to paper in a single Zaffaroni-type solvent system. Using the augmented Porter-Silber reaction of Lewbart and Mattox, very small quantities are readily measured. Values of from 50 to 150 micrograms per day are normally excreted. This value may be trebled on sodium restriction. The method requires only one working day (Fig. 4).



'TETRAHYDRO' METABOLITE OF ALDOSTERONE

Fig. 4. This compound is excreted as a glucuronide conjugate and may be quantitatively the most important of aldosterone metabolites.



DEHYDROEPIANDROSTERONE

Fig. 5. Dehydroepiandrosterone is the principal precursor of the urinary 17-KS, androsterone and etiocholanolone.

Adrenal Androgens (The 17-Ketosteroids)

Dehydroepiandrosterone (DHEA) is weakly androgenic and exists in the peripheral blood in higher concentration than other steroid hormones. Its production rate has been estimated to average 55 mg. per day. DHEA appears to be the principal precursor of the urinary 17-KS (androsterone and etiocholanolone). DHEA is exclusively of adrenal origin. Its precursor, 17α-OH-pregnenolone, may be secreted into the circulation where it is oxidized to DHEA (Fig. 5).

TABLE I. URINARY EXCRETION IN MG. 24 HOURS

17-OHCS	17-KGS	17-KS	Aldosterone (pH-1-3-oxo conjugate)	Tetra-hydroaldosterone
3-12 (both sexes)	5-26 (males) 4-17 (females)	8-23 (males) 5-18 (females)	.002-.016	.05-.15

It is unfortunate that the urinary 17-KS procedure is used as a parameter of adrenocortical function in any of the adrenal disorders except those characterized by virilism. The urinary 17-KS excretion is the least reliable index of adrenocortical function.

In Table I are listed normal values for urinary excretion of 17-OHCS, 17-KGS, 17-KS, aldosterone (pH 1-3-oxo-conjugate) and tetrahydroaldosterone.

Classification of Adrenal Cortical Dysfunction

I. *Hypofunction of the Adrenal Cortex*

- A. Primary—panhypocorticalism—underproduction of cortisol, aldosterone and adrenal androgen.
  - 1. Acute—Addisonian crisis, adrenal "apoplexy" and (?) Waterhouse-Friderichsen Syndrome.
  - 2. Chronic—Addison's disease
    - (a) Complete or classical
    - (b) Partial or "limited" adrenal cortical reserve
- B. Secondary hypocorticalism—mainly cortisol undersecretion due to hypopituitarism
  - 1. Panhypopituitarism
  - 2. Inhibition of adrenocorticotropin (ACTH) synthesis and/or release during and after administration of cortisol or its synthetic analogs
- C. Primary isolated corticotropin deficiency
- D. Inborn errors of steroid metabolism—variable capacity for secretion of cortisol due to relative deficiencies in adrenal cortical hyperplasia
- E. Accelerated cortisol catabolism—thyroid storm

II. *Hyperfunction of the Adrenal Cortex*

- A. Cushing's syndrome of cortisol overproduction due to:
  - 1. Bilateral hyperplasia (80 per cent) or unilateral neoplasia (20 per cent)
  - 2. Bilateral hyperplasia associated with pituitary tumor and pigmentation (primary ACTH excess?)
  - 3. Bilateral hyperplasia associated with extra-adrenal adenocarcinoma (bronchogenic, thyroid, pancreatic, prostatic and thymic)
- B. Conn's syndrome of aldosterone overproduction due to neoplasia or bilateral hyperplasia—primary aldosteronism
- C. Secondary aldosteronism associated with edematous states and (?) malignant hypertension.
- D. Adrenal virilizing syndromes. Adrenal virilism of androgen overproduction (dehydroepiandrosterone or precursor) due to hyperplasia and neoplasia.
  - 1. Inborn errors in cortisol synthesis—congenital virilizing hyperplasia
  - 2. Incomplete penetrance of genetic defect in cortisol synthesis—adult virilizing hyperplasia.
- E. Mixed syndromes of corticosteroid and androgen overproduction due to hyperplasia and neoplasia
- F. Adrenocortical feminizing tumors

I. Adrenal Cortical Hypofunction

A. *Primary Adrenal Insufficiency* (Panhypocorticalism)

1. Acute—A provisional diagnosis of acute adrenocortical failure or Addisonian crisis requires that treatment be instituted without delay. Confirmation by a corticotropin response test should be postponed until recovery is obtained. The presence of pigmentation, hyponatremia, hyperkalemia and azotemia in a patient with peripheral circulatory failure is strongly suggestive of Addison's disease, however, the identical clinical picture may occur in salt-losing nephritis. Failure of the patient to conserve administered sodium while receiving adequate replacement of adrenal steroid hormones suggests a primary renal lesion. Peripheral vascular collapse due to septicemia has been attributed to secretory failure of the adrenals since the original reports of Waterhouse[11] and Friderichsen.[12] To date, permanent adrenal insufficiency has not been noted in those patients who have survived the Waterhouse-Friderichsen syndrome. Melby and Spink[13] have reported the concentrations of cortisol in the plasma of 22 patients with shock due to infection and all values were higher than basal levels measured in healthy subjects. In six patients tested, there was a rise in plasma cortisol following the administration of corticotropin. Finally, the therapeutic effects of administered cortisol in these cases cannot be regarded as due to "replacement" because doses of the steroid hormones "required" greatly exceeded the maximum secretory capacity

of the adrenal cortex. It is probable that acute adrenal insufficiency is not a feature of the Waterhouse-Friderichsen syndrome.

2. *Chronic Adrenocortical Insufficiency*—Addison's Disease. The frequency of diagnosis of Addison's Disease has increased. This increasing recognition is due in part to the availability of specific tests of adrenocortical function. In addition the entity of "partial" adrenal insufficiency has been recognized in which a remnant of functioning adrenal cortex is continuously stimulated by endogenous corticotropin to produce a normal basal steroid output. When an infusion of corticotropin is given, however, no rise in plasma cortisol can be detected. The patient with "incomplete" or "partial" Addison's Disease lacks adrenocortical reserve and symptoms are precipitated by trauma or febrile illness but may be absent or minimal without the superimposition of stress.

The diagnosis of adrenal insufficiency can be established reliably only by the demonstration of failure to increase blood cortisol levels or urinary 17-hydroxycorticosteroid (17-OHCS) or 17-ketogenic steroid (17-KGS) excretion in response to intravenous or intramuscular injections of corticotropin (ACTH). Urinary 17-ketosteroid (17-KS) excretion is unreliable as an index of adrenocortical functional capacity. A single determination of plasma cortisol, 24-hour urinary excretion of 17-OHCS or 17-KGS are not useful in the diagnosis of adrenal insufficiency and may be misleading. A test standardized by Jenkins et al[14] for urinary excretion of 17-OHCS is commonly employed:

Twenty-four-hour urine collections are made on two control days and two consecutive days during which 25 I.U. of ACTH is injected intravenously over eight hours. Normal subjects excreted 1-10 mg. 17-OHCS per day on control days and increased excretion to 5-25 mg. on the first day of ACTH stimulation and to 15-41 mg. on the second day. Patients with Addison's Disease fail to excrete additional 17-OHCS on days of ACTH stimulation.

Christy et al[15] simplified the testing of adrenocortical functional capacity by measuring the change in concentration of cortisol in the plasma before and after a four-hour intravenous infusion of ACTH. A similar procedure has been used by the author for the past four years:

An intravenous infusion of 25 U.S.P. units of ACTH (Upjohn, Sterile Corticotropin Injection) dissolved in 500 ml. of 5 per cent dextrose in saline is given over a period of four hours. Fifteen ml. heparinized blood is secured initially and at the conclusion of the infusion of ACTH. The erythrocytes are separated from the plasma within 30 minutes. The plasma samples are frozen until determinations of cortisol are made. A modification of the method of Silber and Porter[3] as described by Wu and Mason[16] is employed for analysis. The results for eight normal subjects are summarized in Table II. The mean control value for cortisol was 15 μg./100 ml. of plasma with a range of 5-24 μg. per cent. Following the infusion of corticotropin the concentrations rose to a range of 32 to 63 μg. per cent with a mean of 46 μg. per cent.

ACTH stimulation tests were carried out in nine patients with Addison's Disease. These results are summarized in Table III. It is apparent that no response to ACTH in any patient was obtained. This remarkable separation from the normal group has been observed repeatedly. Because of its high validity we have adopted this test as the *sine qua non* for the definitive diagnosis of adrenal insufficiency.

TABLE II. EFFECT OF ACTH (25 U.S.P. UNITS INTRAVENOUSLY OVER A FOUR HOUR PERIOD) ON PLASMA CORTISOL CONCENTRATIONS IN NORMAL SUBJECTS

Subject No.	Age	Sex	Plasma Cortisol (ug./100 ml.)	
			Before ACTH	After ACTH
1	54	M	16	52
2	37	M	5	32
3	45	M	19	40
4	72	M	15	63
5	31	F	10	33
6	52	F	24	44
7	21	F	14	51
8	36	F	21	52
			Mean =15±6* Range= 5—24	Mean =46±10 Range=32—63

*Standard deviation.

TABLE III. EFFECT OF ACTH (25 U.S.P. UNITS INTRAVENOUSLY OVER A FOUR HOUR PERIOD) ON PLASMA CORTISOL CONCENTRATIONS IN PATIENTS WITH ADDISON'S DISEASE

Subject	Age	Sex	Plasma Cortisol (ug./100 ml.)	
			Before ACTH	After ACTH
M. O.	52	M	29	26
M. J.	35	F	13	12
E. G.	40	F	18	12
D. P.	50	M	26	22
W. R.	51	M	2	0
R. D.	38	M	2	1
W. N.	33	M	0	0
M. D.	35	F	0	0
D. O.	53	M	0	0
			Mean =10 Range=0-29	Mean =8 Range=0-26

TABLE IV. EFFECT OF ACTH (25 U.S.P. UNITS I.V. OVER FOUR HOURS) ON PLASMA CORTISOL CONCENTRATIONS IN PATIENTS WITH PANHYPOPITUITARISM BEFORE AND AFTER DAILY ACTH STIMULATION

Subject	Age	Sex	Plasma Cortisol (ug./100 ml.)			
			Initial Test		After ACTH	M x 4
			Before ACTH	After ACTH	Before ACTH	After ACTH
A. P.	69	F	1	13	—	—
O. L.	39	M	0	0	32	39
C. A.	56	M	5	11	33	61
Q. S.	30	M	8	20	28	36
W. F.	45	M	8	29	—	—
L. D.	57	M	14	21	44	89
R. F.	59	M	19	22	10	34
F. N.	25	M	0	6	0	17
J. B.	26	M	5	7	—	—

B. *Secondary Adrenocortical Insufficiency* (Hypocorticalism)

It should be emphasized that aldosterone deficiency is not ordinarily observed in hypopituitarism. Some patients develop hyponatremia and its cause is incompletely understood. On the other hand, hyperkalemia is not observed. The pallor of panhypopituitarism differentiates it from the hyperpigmentation of Addison's Disease.

Patients having panhypopituitarism may have attenuated responses to stimulation by exogenous ACTH. There is often overlap with the normal control responses. The ACTH test will ordinarily separate primary from secondary adrenocortical insufficiency. However, in some patients with panhypopituitarism, no response may be detected on the initial ACTH test. Repeated stimulation of the adrenal cortex with zinc-corticotrophin (80 units IM daily for four days) restores normal responsiveness of the adrenal to intravenous ACTH. In Table IV the responses of nine patients with panhypopituitarism are tabulated. Investigations on the effect of bacterial pyrogen on pituitary-adrenal secretory activity[17] lead to the development of a new clinical procedure, the pyrogen test, for the assessment of ACTH production in patients following steroid therapy and in patients with hypopituitarism.[18] Blood samples for plasma cortisol determinations are obtained before and at 30, 60, 120, 180, and 240 minutes after an intravenous injection of Pyrexal Rx or Lipexal Rx*, a lipopolysaccharide (endotoxin) derived from *Salmonella abortus equi.* In healthy subjects, the injection of pyrogen is followed in two hours by an abrupt rise in plasma cortisol concentration. In patients with panhypopituitarism and patients receiving large doses of cortisol or its analogs, no response is obtained. Pituitary-adrenal responsiveness to injected pyrogen gradually improved up to five months after the discontinuance of hormone therapy.[19]

A chemical inhibitor of a specific adrenal enzyme (β-hydroxylase) has been developed from DDT-like cytotoxins. This substance is relatively non-toxic and has been designated as SU-4885. SU-4885 blocks the last step in the production of cortisol:

17-OH-progesterone → 11-deoxycortisol-[SU-4885] → cortisol. When cortisol activity decreases, the pituitary signalled by the mid-brain accelerates the production of ACTH. The ACTH, in turn, stimulates the production of more corticosteroid and the block by SU-4885 results in a pile up of 11-deoxycortisol (compound S) as a precursor. The 11-deoxycortisol gives a positive reaction to the Porter-Silber reagent and its increased levels indicates that pituitary function remains.[20]

II. Adrenocortical Hyperfunction

A. *Cushing's Syndrome of Cortisol Excess*

The diagnosis of Cushing's syndrome due to either hyperplasia or tumor of the adrenal cortex is confirmed only when urinary excretion of 17-OHCS (more than 12 mg./24 hours) is clearly elevated. The excretion of 17-KGS correspondingly reflect the excessive production of cortisol. Measurement of 17-KS excretion is not helpful in pure Cushing's syndrome. It should be emphasized that 17-OHCS excretion may fluctuate considerably, thus repeated urinary specimens should be examined if clinical findings warrant.[21]

*Kindly supplied through the courtesy of Dr. Fred Schultz of the Wander Company, Chicago, Illinois.

In those cases of Cushing's syndrome so studied, it has not been possible to demonstrate the normal diurnal variation of cortisol levels in the plasma. If, for example, the 8 a.m. level does not exceed the 8 p.m. level, the diagnosis of Cushing's syndrome is nearly certain.*

Hyperresponsiveness to ACTH in terms of blood cortisol levels and urinary 17-OHCS excretion is commonly present but not invariably. Further, the hyperresponsiveness to ACTH may be elicited in patients having tumors of the adrenal cortex and cannot be relied upon to distinguish hyperplasia from tumor.

Suppression of 17-OHCS excretion in urine to near zero levels can be accomplished in normal subjects with potent cortisol analogs (dexamethazone, fluoroprednisolone) in a dosage of 2.0 mg./day. Most patients with Cushing's syndrome continue to excrete excessive amounts of 17-OHCS in urine on this dose of the cortisol analog.

Doses of 8.0 mg. or more per day of these potent cortisol analogs will result in suppression of 17-OHCS output in urine in patients whose Cushing's syndrome is due to bilateral adrenocortical hyperplasia. This effect is not observed when the condition is due to tumor.

In summary, when elevated amounts of 17-OHCS are excreted in the urine in a patient having the clinical manifestations of Cushing's syndrome, the diagnosis is confirmed. It is generally agreed that no present test invariably differentiates between hyperplasia and tumor, although the suppression tests are most often correct. Most patients who have Cushing's syndrome must undergo surgical exploration of the adrenal glands, especially since the most reliable and definitive therapy (excision) can at the same time be accomplished. However, when hyperpigmentation is associated with the other features of Cushing's syndrome, an ACTH producing pituitary tumor should be ruled out.[22]

B. *Conn's Syndrome of Mineralocorticoid Excess—Primary Aldosteronism*

The constellation of muscular weakness, tetany, polyuria, polydypsia and paresthesias associated with hypertension in a non-edematous patient with laboratory findings of hypokalemia, alkalosis, hypernatremia, alkaline urine, isosthenuria and proteinuria is almost certainly due to the excessive production of aldosterone. The classical features of Conn's syndrome[23] are found in approximately one-fourth of the patients examined who are proved subsequently to have mineralocorticoid excess.

The diagnostic criteria for this "not-so-rare" disorder (perhaps 200 cases have been recognized since 1955) are inadequate. When renal insufficiency supervenes due to the hypertension, the biochemical findings become difficult to interpret.

The measurement of urinary aldosterone excretion is difficult and when carried out successfully may be unrewarding as the value may not be greatly elevated. The so-called "secondary" aldosteronism of nephrotic syndrome, cirrhosis with ascites, congestive heart failure and malignant hypertension is associated with much higher levels of aldosterone in the urine than are observed in cases of primary aldosteronism. The presence of hypokalemia in patients with malignant hypertension is not unusual so that the separation of primary from secondary aldosteronism may be difficult.

C. *Adrenal Virilizing Syndromes*

The excretion of increased amounts of 17-KS in urine by the female is almost always due to hyperplasia or tumor of the adrenal cortex. When 17-KS excretion is in excess of 50-60 mg., the presence of large amounts of dehydroepiandiosterone can be detected by a simple procedure, the Allen test.[24] When positive, the presence of an adrenocortical tumor is almost certain. However, tumor cannot be reliably differentiated from hyperplasia in all cases.

The presence of increased amounts of pregnanetriol in urine suggests a genetic disturbance, congenital virilizing hyperplasia. A simple comparison of 17-OHCS with 17-KGS (17-KGS would include pregnanetriol) is indicative of the adrenogenital syndrome in that the 17-OHCS may be normal or low while the 17-KGS are elevated. We have found this simple screening procedure very helpful.

Conclusions

1. Primary adrenocortical insufficiency is proved if ACTH infusions fail to increase the level of blood cortisol or excretion of urinary cortisol metabolites (17-OHCS and 17-KGS).

2. Secondary adrenocortical insufficiency is demonstrated by the failure of injected bacterial

*Observations of Dr. R. P. Doe and Dr. E. B. Flink.

pyrogen to increase blood cortisol levels in an individual responding normally to ACTH. Failure of urinary 17-OHCS to increase after 250 mg. of SU-4885 every 6 hours is also indicative of adrenocorticotropin deficiency.

3. Cushing's syndrome of cortisol excess may be confirmed by the presence of elevated 17-OHCS or 17-KGS excretion in urine.

4. Suppression tests using potent cortisol analogs may indicate the presence of an autonomously functioning tumor when doses of 8 mg. per day of dexamethasone fail to suppress 17-OHCS output. The converse relationship may not be reliable. ACTH stimulation tests are usually not helpful.

5. Conn's syndrome of mineralocorticoid excess is defined by the demonstration of inability to conserve potassium on a low K^+ intake and hyperaldosteronuria in a potassium depleted, hypertensive patient.

6. Virilism due to excess production of androgen by the adrenal cortex is usually associated with increased urinary 17-KS excretion. In congenital virlizing hyperplasia (adrenogenital syndrome), large amounts of pregnanetriol may be found. Low or normal 17-OHCS excretion coupled with increased 17-KGS excretion is highly suggestive of raised pregnanetriol levels in urine.

Acknowledgment

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Bibliography

1. Bush, I. E., and Sandberg, A. A.: Adrenocortical hormones in human plasma. J. Biol. Chem., 205: 783, 1953.
2. Peterson, R. E., Wyngaarden, J. B., Guerra, S. L., Brodie, B. B., and Bunim, J. J.: The physiological disposition and metabolic fate of hydrocortisone in man. J. Clin. Invest., 34:1779, 1955.
3. Silber, R. H., and Porter, C. C.: The determination of 17, 21-dihydroxy-20-ketosteroids in urine and plasma. J. Biol. Chem., 210:923, 1954.
4. Appleby, J. I., Gibson, G., and Norymberski, J. K.: Indirect analysis of corticosteroids. I. The determination of 17-hydroxycorticosteroids. Biochem. J., 60:453, 1955.
5. Callow, N. H., Callow, R. K., and Emmens, C. W.: Colorimetric determination of substances containing the grouping CH_2CO in urine extracts as an indication of androgen content. Biochem. J., 32:1312, 1938.
6. Drekter, F. G., Herster, A., Scism, G. R., Stern, S., Pearson, S., and McGavack, T. N.: The determination of urinary steroids. I. The preparation of pigment-free extracts and a simplified procedure for the estimation of total 17-ketosteroids. J. Clin. Endocrinol., 12:55, 1952.
7. Farrell, Gordon: Glomerulotropic activity of an acetone extract of pineal tissue. Endocrinology, 65:239, 1959.
8. Neher, R. and Wettstein, A.: Physiochemical estimation of aldosterone in urine. J. Clin. Invest., 35:800, 1956.
9. Ulick, S., Laragh, J. H., and Lieberman, S.: The isolation of a urinary metabolite of aldosterone and its use to measure the rate of secretion of aldosterone by the adrenal cortex of man. Tr. A. Am. Physicians, 71:225, 1958.
10. Melby, J. C., Dale, S. L., and August, J. T.: Measurement of tetrahydroaldosterone in human urine. (To be published).
11. Waterhouse, R.: Case of suprarenal apoplexy. Lancet, 1:577, 1911.
12. Friderischsen, C.: Nebennierenapoplexie bei kleinen Kindern. Jahrb. f. Kinderh., 87:109, 1918.
13. Melby, J. C., and Spink, W. W.: Comparative studies on adrenocortical function and cortisol metabolism in healthy adults and in patients with shock due to infection. J. Clin. Invest., 37:1791, 1958.
14. Jenkins, D., Forsham, P. H., Laidlaw, J. C., Reddy, W. J., and Thorn, G. W.: Use of ACTH in diagnosis of adrenal cortical insufficiency. Am. J. Med., 18:3, 1955.
15. Christy, N. P., Wallace, E. Z., and Jailer, J. W.: The effect of intravenously-administered ACTH on plasma 17, 21-dihydroxy-20-ketosteroids in normal individuals and in patients with disorders of the adrenal cortex. J. Clin. Invest., 34:899, 1955.
16. Wu, C., and Mason, H. L.: The chemical determination of cortisol in blood plasma. Proc. Staff Meet. Mayo Clin., 33:627, 1958.
17. Melby, J. C., Egdahl, R. H., and Spink, W. W.: Effect of brucella endotoxin on adrenocortical function in the dog. Fed. Proc., 16:425, 1957.
18. Melby, J. C.: Assessment of adrenocorticotropic activity with bacterial pyrogen in hypopituitary states. J. Clin. Invest., 38:1025, 1959.
19. Melby, J. C.: Assessment of adrenocorticotropic activity in man following steroid therapy. Program of the First International Congress on Endocrinology, Copenhagen, Denmark, July, 1960.
20. Lidelle, G. W., Estep, H. L., Kendall, J. W., Williams, W. C., and Townes, A. S.: Clinical application of a new test of pituitary reserve. J. Clin. Endocrinol., 19:875, 1959.
21. Birke, Gunnar and Diczfalusy, Egon: Fluctuation in the excretion of adrenocortical steroids in a case Cushing's syndrome. J. Clin. Endocrinol., 16:286, of 1956.
22. Salassa, R. M., Kearns, T. P., Kernohan, J. W., Sprague, R. G., and MacCarty, C. S.: Pituitary tumors in patients with Cushing's syndrome. J. Clin. Endocrinol., 19:1523, 1959.
23. Conn, J. W.: Primary aldosteronism, a new clinical syndrome. J. Lab. & Clin. Med., 45:3, 1955.
24. Allen, W. M., Hayward, S. J., and Pinto, A.: A color test for dehydroisoandrosterone and closely related steroids of use in the diagnosis of adrenocortical tumors. J. Clin. Endocrinol., 10:54, 1950.

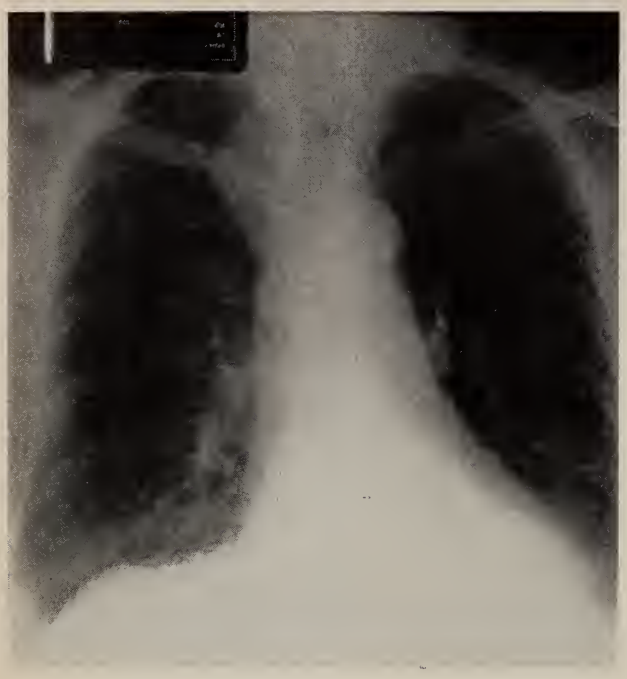


Fig. 1. A mass is present in the right superior mediastinum. The patient is an obese, hypertensive woman, aged sixty-eight, who had had a thyroidectomy in 1945. A twenty-four-hour radioiodine uptake was 30 per cent over the thyroid region in the neck with no uptake in the substernal or infraclavicular regions. Right thoracotomy (October 14, 1959) disclosed the mass to be an elongated and buckled innominate artery.

Buckling and Kinking

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IT IS BECOMING apparent that a significant proportion of cerebrovascular thromboses have their origins in the extracranial carotid arterial system. DeBakey et al,[1] in reporting upon 174 patients with manifestations of arterial insufficiency of the cerebrum and upper extremities, found an extracranial source of arterial obstruction in 42 per cent. Direct surgical attack upon the carotid system in the neck has been utilized with increasing frequency since the procedure was first reported successful by Eastcott, Pickering and Rob[2] in 1954. Results following surgery have been gratifying in cases where neurologic deficits have been transient and arterial obstruction is found to be incomplete.[1,3,4] Those patients manifesting complete arterial obstruction coupled with persisting neurologic deficits derive much less benefit from arterial surgery,[3,5] though in a few instances brilliant results have followed operative intervention.[1,4] Appreciation of the importance of diagnosing intermittant insufficiency of the carotid arterial system before partial obstruction becomes complete and neuro-



Fig. 2. Forward intravenous angiocardiogram illustrating buckling of the innominate and right common carotid arteries. The patient is a hypertensive woman, aged seventy, with a pulsating globular mass in the base of the right side of the neck. X-ray examination ruled out an aneurysm.

logic changes irreversible has led to increased usage of carotid angiography. It is reasonable to expect that angiography will come to be even more commonly employed in persons with fresh strokes, the prodromata of impending carotid occlusion, or abnormal physical findings in the neck (See the papers by Millikan and Siekert,[6] and Hurwitz et al[7] for detailed descriptions of the carotid insufficiency syndrome). In view of this increasing interest in carotid angiography, a discussion of two abnormalities of the extracranial carotid system encountered from time to time is in order. These are "buckling" of the innominate-carotid artery at the base of the neck, and "kinking" of the internal carotid artery. Both terms have been employed loosely in the medical literature, sometimes interchangeably. Their delineation and differentiation is important, as their etiology, implication, therapy and prognosis differ.

Buckling of the Innominate-Carotid System

This condition, first described by Coulsons[8] in

1852, consists of a pronounced buckling of the innominate or carotid artery at the base of the right side of the neck. Occasionally, buckling is seen bilaterally, and rarer still, solely on the left. For the most part, it occurs in elderly, obese, hypertensive women with kyphosis.[9] It is thought to be an acquired process due to arteriosclerosis, with resultant elongation of the aorta, uncoiling of the aortic arch, and buckling of the proximal supra-aortic arterial branches. Buckling of the innominate or carotid artery is compatable with a normal life expectancy. The condition may be confused, however, with other lesions which require surgery.

If buckling is limited to the innominate artery, no cervical component is present, and a mass appears in the superior mediastinum (Fig. 1). If buckling of the innominate artery is overlooked, the mass may be thought to be of thyroidal, thymic, enterogenous or lymphatic origin, and an ill-advised thoracotomy may be undertaken.

If buckling involves both the innominate and the proximal carotid artery, a pulsating mass appears in the base of the neck, usually on the right. A mistaken diagnosis of aneurysm of the carotid artery may be made (Fig. 2). Also, the tortuous carotid artery often overlies the trachea in the suprasternal notch, and tracheostomy in such a person without prior palpation of the neck for pulsatile structures could end in disaster.

The diagnosis of buckling may be made if the possibility of its presence is kept in mind. Characteristically, the posteroanterior chest radiograph provides a clue in that the aortic arch rides higher than is usually seen, often presenting at or above the level of the clavicles.[16] We have used forward angiocardiography to good advantage in the delineation of the lesion. Fifty to 80 cc. of 90 per cent sodium diatrizoate Hypaque® or 85 per cent methylglucamine diatrizoate cardiografin is employed in conjunction with a Schönander rapid cassette changer. Single film technique is adequate if the circulation time from the basilic vein can first be determined with a tracer dose of radioactive albumin.

In summary, buckling of the great vessels at the base of the neck is a condition not requiring operation. Its significance is that it may be confused with lesions that do require surgery. If it is remembered that the process occurs in elderly, obese, hypertensive individuals who frequently are kyphotic, the diagnosis will seldom be missed.

Kinking of the Cervical Portion of the Internal Carotid Artery

This malformation has been reported sporadically in the literature since 1898. Such reports[12-15] have been directed chiefly to the otolaryngologist in connection with the occasional catastrophe of transection of the internal carotid artery during tonsillectomy, or rarer still, adenoidectomy. The anomaly consists of a tight sigmoid loop of the internal carotid artery beginning 2 to 3 cm. above the bifurcation of the common carotid artery. The loop most often lies in a sagittal plane, but occasionally is noted in a coronal plane. Very rarely the internal carotid artery may describe a circle.[17] Almost invariably the initial flexion of the artery is in a forward (anterior) direction. The descending limb is approximately 2 cm. long, and is followed by a second 180-degree angulation of the artery, from whence the vessel takes a rather direct course to the carotid canal in the base of the skull (Fig. 3).

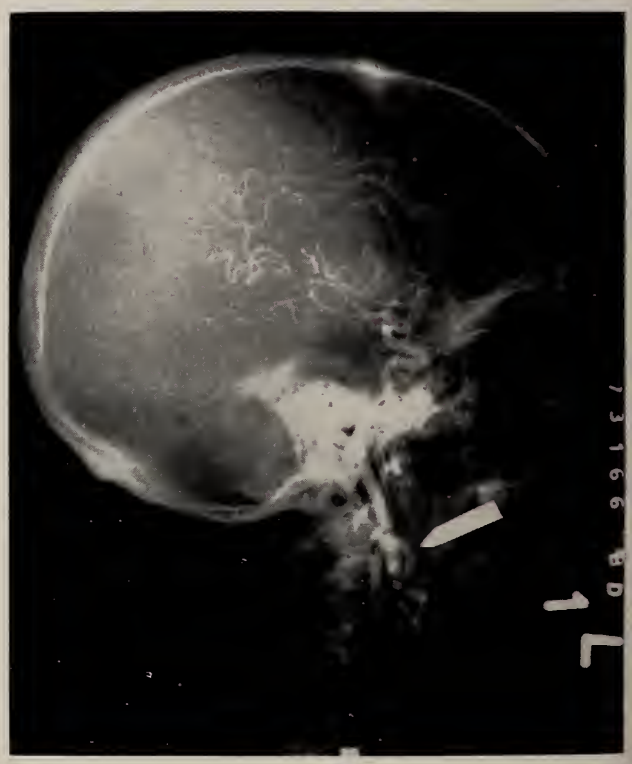


Fig. 3. Left carotid angiogram. (Courtesy of Michael P. Sperl, M.D., St. Paul, Minnesota.) The patient is a woman, aged fifty-three, who had had several episodes of transient (three to four minutes) right hemiparesis. The kinking of the internal carotid artery begins 3 to 4 cm. above the bifurcation of the common carotid artery.

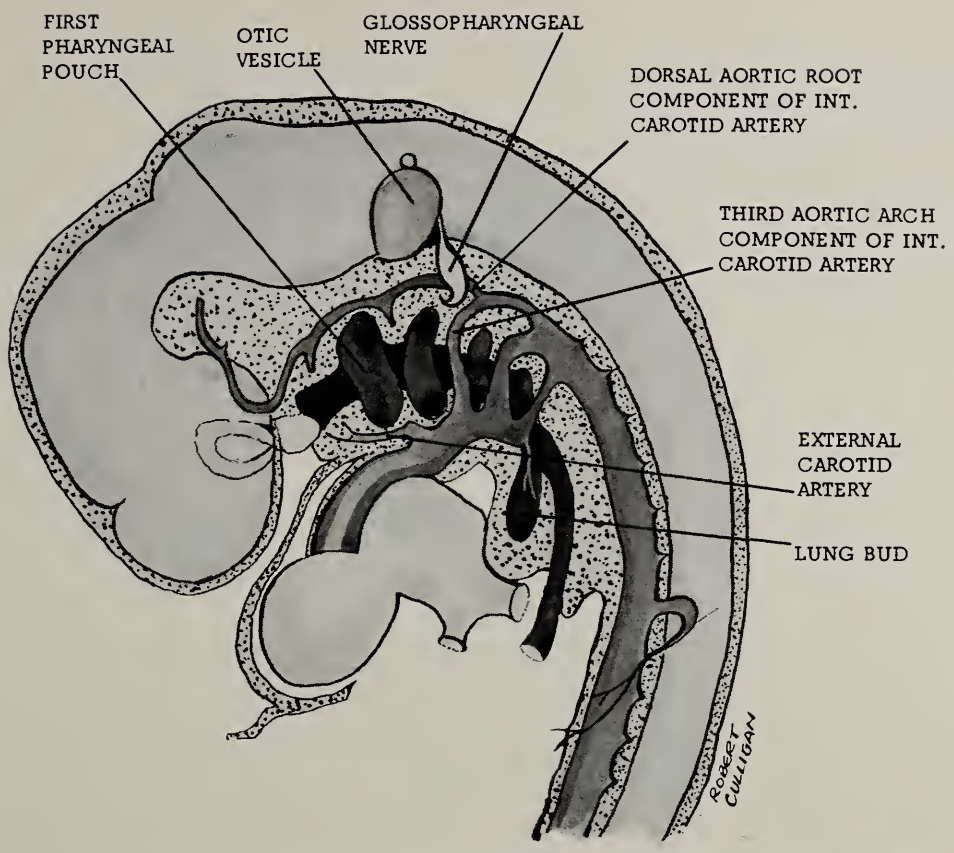


Fig. 4. 6 mm. human embryo. The first and second aortic arches have resorbed, leaving the third aortic arch, which together with the dorsal aortic root is to form the internal carotid artery. Note the pronounced anterior angulation of the artery at the junction of the third arch component and the dorsal aortic root component. Note also the intimate relation between the glossopharyngeal nerve and the angulation of the artery.

The abnormality has been variously attributed to arteriosclerosis, a regressive phenomenon, or an embryologic anomaly. The fact that the lesion has been observed in children as young as two years[18] makes the arteriosclerotic theory unlikely. Flemming[16] has attributed the phenomenon to a regression in the human being to the rete mirable (a cavernous type carotid artery) seen in a few species of ruminant animals. Few support this view. At the present time, most authorities favor the theory of embryologic derivation. This concept, introduced in 1898 by Kelly[11] and further elaborated by him in 1925,[20] is based on the observation that the internal carotid arteries are derived from both the third aortic arch and the dorsal aortic root. In the 6 mm. embryo (Fig. 4), note the pronounced anterior angulation in the vessel that is to become the internal carotid artery. Note also the intimate relation of the glossopharyngeal nerve (C. N. 1X) to the angulation of the artery. It is postulated that inordinate differential growth of the third arch portion of the internal carotid artery occurs as the heart descends into the mediastinum leading to persistance of the anterior angulation of the extracranial portion of the internal carotid artery, with the kink persisting into postnatal life. The theory is substantiated by the following:

1. The condition is bilateral in 50 per cent of cases, making one think in terms of a developmental lesion.

2. The initial flexion is forward, as is the angulation seen in fetal development.

3. The intimate association of the glossopharyngeal nerve and the arterial angulation in the embryo is invariably seen in the same relationship in the adult (Fig. 5).

Kinking of the internal carotid artery is of clinical significance in three ways:

1. The implications regarding tonsil and adenoid surgery are obvious, and need not be discussed, save to reiterate the maxim that digital and visual inspection of the pharynx for unusual arterial pulsation is mandatory before proceeding with either procedure.

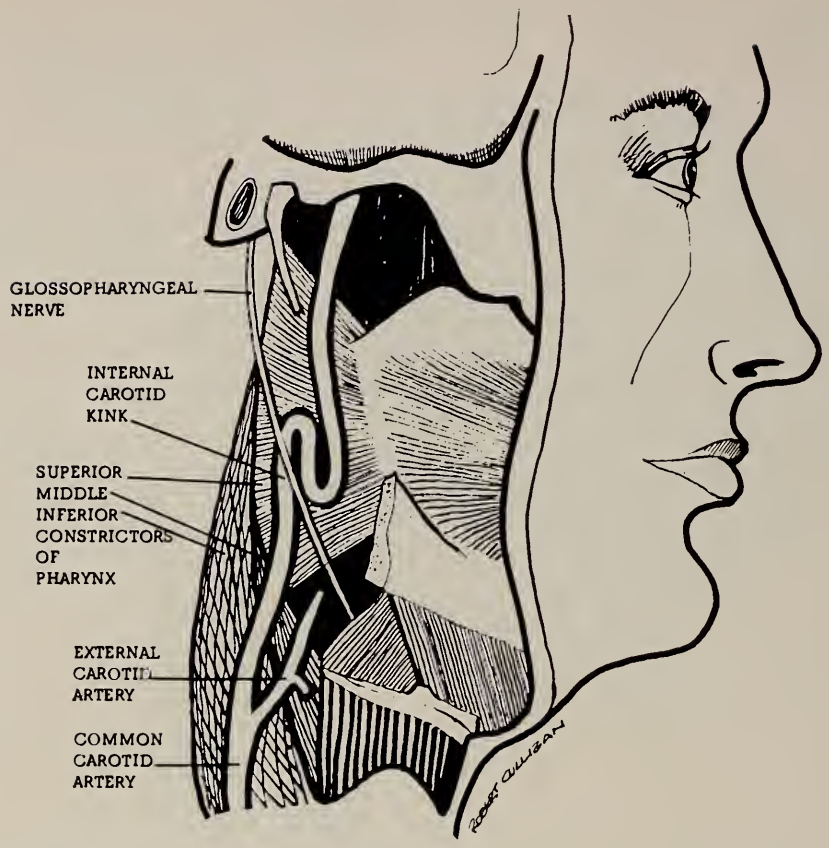


Fig. 5. Kinking of the internal carotid artery as it is most often seen. Note that the kink lies in close relation to the tonsillar fossa, being separated from it by superior constrictor of the pharynx. In addition, the intimate relation between the glossopharyngeal nerve and the kinked internal carotid artery is preserved.

2. Kinking may or may not impair the flow of blood through the carotid artery. Quattlebaum[21] has reported three cases of this condition manifesting the signs of carotid insufficiency. On the other hand, he has noted cases of kinking which are asymptomatic.

3. Acquired aneurysms are very occasionally encountered in association with kinking[22,23] (Fig. 6). These usually present as a pulsatile mass in the neck just below the angle of the jaw. Undoubtedly the aneurysm results from continued stress on the arterial wall at the angulation of the vessel.

Diagnosis of kinking of the internal carotid rests upon angiographic visualization of the carotid system. Although direct percutaneous carotid puncture is often employed, we believe that mapping of the entire carotid system is preferable. This may be accomplished by retrograde aortic catheterization by way of the femoral artery, or by direct puncture of the aortic arch via the right supraclavicular approach described by Eisman and Rainer.[24] In this way, both carotid arteries are visualized in their entirety, as well as the vertebral arteries, and proximal carotid or innominate occlusion (pulseless disease) will not be overlooked.

Indications for surgical intervention in this condition depend in part on whether the lesion is symptomatic. Quite obviously, aneurysms should be removed. Persons exhibiting neurologic manifestations due to carotid insufficiency should be explored before flow through the vessel ceases. It is our belief that those persons fortuitously diagnosed as having kinking who are asymptomatic should be followed expectantly, the repair being deferred until such a time that the lesion begins to cause difficulty.

Techniques for surgical correction of the lesion continue to evolve. Repair is best effected by excision of the kink and primary repair of the vessel. An alternative to excision of the kink is excision of a segment of the common carotid artery,[21] uncoiling of the internal carotid kink, and reanastomosis of the common carotid artery. We have had no experience with the latter method. Cross clamping of the carotid vessels is best avoided unless provision is made for internal or external shunting[1] during the period of occlusion.

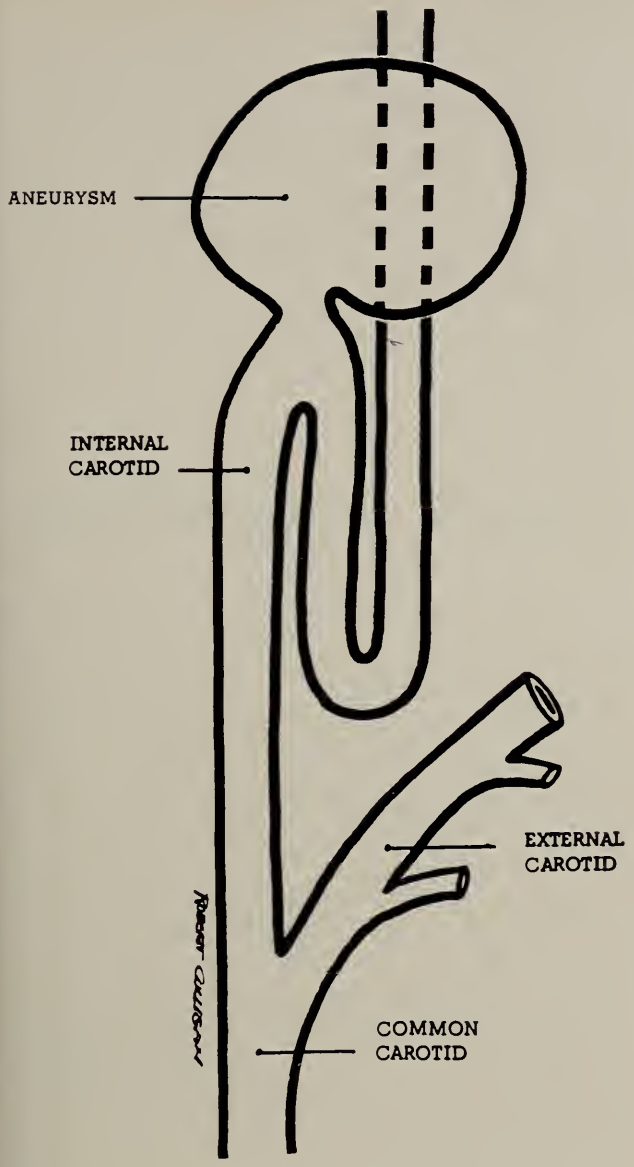


Fig. 6. An acquired aneurysm arising in a kinked internal carotid artery. Two months prior to being seen, this forty-year-old man developed a pulsating mass in the right side of the neck, just below the angle of the mandible. A thin-walled aneurysm was disclosed. The carotid artery was cross clamped without bypass or hypothermia, the aneurysm and the kink were excised, and primary arterial anastomosis effected. The distal carotid artery pulsated well and the patient made an uneventful recovery. At present, we would not cross clamp the carotid artery without either bypass or hypothermia.

Hypothermia[2] has been reported as an alternative to shunting during occlusion, but at present most authors favor the shunting maneuver.

In summary, buckling of the innominate-carotid arterial system and kinking of the internal carotid artery have been discussed. Differences in etiology, clinical implications, and therapy in the two conditions have been outlined and contrasted.

References

1. DeBakey, M. E., Crawford, E. S., Colley, D. A., and Morris, G. C.: Surgical considerations in occlusive disease of the innominate, carotid, subclavian and vertebral arteries. Ann. Surg., 149:690-710, 1959.
2. Eastcott, H. H. G., Pickering, G. W., and Rob, C. G.: Reconstruction of the internal carotid artery. Lancet, 2:994-996, 1954.
3. Bahnson, H. T., Spencer, F. C., and Quattlebaum, J. K.: Surgical treatment of occlusive disease of the carotid artery. Ann. Surg., 149:711-720, 1959.
4. Freeman, T. R., and Lippit, W. H.: Carotid artery syndrome. Ann. Surg., 150:1041-1045, 1959.
5. Lemmen, L. J.: Notes on arteriosclerotic occlusion of the internal carotid artery. Univ. Michigan M. Bull., 25:339-348, 1959.
6. Millikan, C. H., and Siekert, R. G.: Studies on cerebrovascular disease IV. The syndrome of intermitant insufficiency of the carotid arterial system. Proc. Staff Meet. Mayo Clin., 30:186-191, 1955.
7. Hurwitz, L. J., Groch, S. N., Wright, I. S., and McDowell, F. H.: Carotid artery occlusive syndrome. AMA Arch. Neurol., 1:491-501, 1959.
8. Coulsons, W.: Peculiar disposition of the large vessels producing a tumor at the base of the neck. Tr. Path. Soc., London, 3:302, 1852.
9. Hsu, I., and Kistin, A. D.: Buckling of the great vessels. AMA Arch. Int. Med., 98:712-719, 1956.
10. Doubleday, L. C.: Radiologic aspects of the carotid artery syndrome. Geriatrics, 14:219-223, 1959.
11. Kelly, A. B.: Large pulsating vessels in the pharynx. Glasgow M. J., 49:28-34, 1898.
12. Edington, G. H.: Tortuosity of both internal carotid arteries. Brit. M. J., 2:1526, 1901.
13. Skillern, P. G.: Anomalous internal carotid artery and its significance in operations on tonsils. J.A.-M.A., 60:172-173, 1913.
14. Fisher, A. G. T.: Sigmoid tortuosity of the internal carotid artery and its relation to the tonsil and pharynx. Lancet, 2:128-130, 1915.
15. Jackson, Joseph L.: Tortuosity of the internal carotid artery and its relation to tonsillectomy. Canad. M. A. J., 29:475-479, 1933.
16. McKenzie, W., and Woolf, C. I.: Carotid abnormalities and adenoidal surgery. J. Laryngol. & Otol., 73:596-602, 1959.
17. Smith, G. M.: Tortuosity of the internal carotid artery. Brit. M. J., 1:1601, 1902.
18. Gass, H. H.: Kinks and coils of the cervical carotid artery. Surg. Forum, 9:721-724, 1958.
19. Flemming, G. *In* Chauveau: Comparative Anatomy of Domesticated Animals. 2nd English Ed., p. 680. New York: Appleton, 1898.
20. Kelly, A. B.: Tortuosity of the internal carotid in relation to the pharynx. J. Laryng. & Otol., 40:15-23, 1925.
21. Quattlebaum, J. K., Upson, E. T., and Neville, R. L.: Stroke associated with elongation and kinking of the internal carotid artery. Ann. Surg., 150: 824-832, 1959.
22. Thompson, J. E., and Austin, D. J.: Surgical management of cervical carotid aneurysms. AMA Arch. Surg., 74:80-88, 1957.
23. Silcox, L. E., and Updegrove, R. A.: Extracranial aneurysm of the internal carotid artery. AMA Arch. Otolaryngol., 69:329-333, 1959.
24. Eisman, B., and Rainer, W. G.: A new technique for thoracic aortography using the right supraclavicular approach. AMA Arch. Surg., 71:859-862. 1955.

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Brief Survey of the

Cholesterol Problem

With Clinical Applications

"To restrict fats or not to restrict fats: that is the question: whether 'tis nobler on the arteries to use corn oil instead of butter or to suffer the flush caused by nicotinic acid? Ay, there's the rub." Thus might a 1960 Shakespeare soliloquize. This article reviews the present status of the controversy raging about cholesterol and atherosclerosis, emphasizing that it is reasonable to attempt correction of an altered lipid mechanism when it can be done safely.

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WHEN questions concerning cholesterol and lipid metabolism are applied to the practice of clinical medicine a great many problems and much diversity of opinion become evident. At one end of this range of opinion is the belief that a disorder of lipid metabolism constitutes the major if not the entire answer regarding the cause of atherosclerosis. At the opposite pole is the arch-conservative opinion that lipid and cholesterol metabolism play only a minor role in atherosclerosis. My view belongs somewhere in the middle of these extremes, perhaps a bit nearer to the lipid hypothesis.

Read at the meeting of the Northern Minnesota Medical Association, Duluth, Minnesota, September 11, 1959.

From the Section of Medicine, Mayo Clinic and Mayo Foundation. The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

My brief survey will have four principal concerns: (1) a review of the evidence for believing that altered lipid metabolism is an important factor in the causation of atherosclerosis; (2) evaluation of the various blood tests associated with hypercholesteremia and atherosclerosis; (3) selection of patients for treatment; and (4) treatment of hypercholesteremia.

Altered Lipid Metabolism—A Prime Cause of Atherosclerosis?

Pathologic Anatomy.—More than a century ago, Virchow[1] recognized that atherosclerotic lesions have a fatty nature and introduced the concept that such lesions are a morphologic manifestation of a primary disorder of fat metabolism. Since

then it has been shown repeatedly that atherosclerotic lesions in the human contain large amounts of cholesterol and other lipid material, and that the proportions of these various lipid fractions closely parallel those concentrations present in human blood.[2-5] Radioisotope techniques provide data which indicate that ingested cholesterol finds its way into the atherosclerotic lesions of human aortas.[6]

Many workers now accept the belief that coronary sclerosis is not a necessary consequence of aging; and all of us have seen at necropsy smooth, widely patent coronary arteries and aortas from many elderly persons. Then, too, in some very young people atherosclerosis develops extensively; and nearly always in such instances severe hypercholesteremia is associated. In addition, pathologists frequently can demonstrate so-called healed atheromas in arteries of patients who have died of a prolonged wasting disease that was associated with normal or low concentrations of serum cholesterol. Hence in certain circumstances the atherosclerotic lesion appears to be suspectible of reversal or at least of arrest. This is a crucial point which challenges us to try to achieve this arrest or reversal by therapeutic means.

However, certain features of the morbid anatomy of atherosclerosis are not explained well by the lipid hypothesis alone. Commonly atherosclerosis is a patchy lesion, and in some cases only one or a few lesions are present in an artery that is otherwise normal. It is curious also that in the same patient certain arteries may be decidedly sclerotic and others entirely uninvolved. And again, may not hemodynamic influencing factors explain why branchings and curvings of arteries have a predilection for atheromatous deposit?[7] Certainly hypertension seems to favor the development of atherosclerosis.[8] These observations are but a few of the stumbling blocks in the path of the lipid hypothesis for atherogenesis.

Experimental Evidence.—Since Anitschow and Chalatow's work[9] with cholesterol-fed rabbits in 1913, animal experimentation has lent strong support to the lipid explanation of atherogenesis. Coronary and aortic atheromatosis has been produced experimentally in fowls, dogs, guinea pigs, rats, and monkeys. It may be noted that with regard to both histologic appearance and biochemical composition, the lesions seen in these animals are remarkably similar—although not identical—to those seen in human beings.[10] The important fact here is that almost all methods used in such experiments have one basic requirement in common: creation of a disturbance of lipid metabolism is necessary to produce the atheromatous lesions.[11] As a corollary to this finding it has been observed that all measures used to prevent or to ameliorate experimentally induced atheromatosis tend to restore lipid metabolism toward normal. A valid objection to data derived from animal experimentation is the obvious fact that disease in man offers a very different and more complex set of circumstances; hence results from animal work cannot be applied directly to the human, even though the inferences may be very suggestive.

Clinical Evidence.—Clinical studies may be cited to support the conclusion that atherosclerosis is related to disturbed lipid metabolism. Statistical studies have shown that mean concentrations of cholesterol in the blood are higher among patients with clinical coronary disease than among patients without such disease.[12] This difference is especially striking in younger age groups. The problem with such studies is that although they are valid in over-all consideration of large numbers of patients, they do not provide for reliable predictions from the cholesterol values of individuals.[13] It is well known that patients with diabetes mellitus, familial hypercholesteremia, xanthomatoses, and perhaps myxedema have a greater incidence of coronary disease than is present in a normal population of comparable age and sex. Again abnormal lipid metabolism with elevated values for blood cholesterol seems to be a common factor in these disease processes.

Correlations with sex status offer some evidence to support the notion that cholesterol is related to the development of atherosclerosis. The relative immunity of premenopausal women to coronary sclerosis is well known, and nearly always the various lipid concentrations in the blood of this group are less than for men of the same age. After the menopause, however, or following bilateral ovariectomy, the mean serum cholesterol and the incidence of coronary disease in the female rise concomitantly.[14] These observations suggest that the salutary influence of estrogen upon atherosclerosis is exercised through its effect on lipid metabolism, which is evidenced by normalization of cholesterol values.[15] Dock[16] recently has challenged this concept, however, and believes that environmental factors are more influential than the effect of estrogen *per se*.

It is widely recognized that a familial history of early death from coronary disease portends an unfavorable outlook for succeeding generations.[17] Thomas[18] has shown that three times as many young healthy medical students with hypercholesteremia had a parent affected by coronary atherosclerosis as did matched subjects with more normal values. Adlersberg[19] believed that an inherited disorder of lipid metabolism manifested by hypercholesteremia is a common factor among most young patients with coronary atherosclerosis. Again, the information seems true in the aggregate but is not specific for the individual.

Exercise has been advanced as a deterrent to atherogenesis. Good data to support this judgment are hard to come by, but some evidence is available. Morris[20] and his English colleagues have reported decreased incidence and severity of coronary disease among postal delivery men and conductors on buses as compared with the more sedentary postal clerks and drivers of buses. Mann and co-workers[21] have shown that exercise will prevent the rise in blood fats which otherwise occurs when normal subjects are overfed by intent.

Emotional stress has long been a favorite whipping boy to blame in part at least for the production of coronary disease; and the available data on it are extensive though not all consistent. Studies have been made of medical students whose concentrations of serum cholesterol increased during preparation for examinations and then returned to previous normal values when this period of stress had passed.[22] Similar changes were observed among tax accountants during and following the busy period of making income tax returns.[23] Russek[24] and Groom and associates[25] also have supplied studies to support the thesis that stress may favor the development of atherosclerosis. It is evident, however, that there can be no clear conclusion on this subject, for many uncontrolled and variable factors enter into consideration.

One of the most controversial subjects is that of dietary fat and its relation to atherogenesis. Much of the evidence regarding this comes from epidemiologic studies. Aschoff[26] noted a decreased incidence of atheromatous disease in Germany during the lean years of World War I and immediately thereafter. Similar observations have been made for World War II in Norway[27] and England. However, upon analysis of the English report[28] it was found that the coronary death rate began to fall even before fat rationing was instituted and started to increase again before rationing was abolished. Dr. Ancel Keys has supplied an enormous amount of information concerning diet and cholesterol concentrations of various population groups and their incidence of fatal coronary disease.[29] His interpretation stresses the fact that populations characterized by a low intake of dietary fat and by low values for serum cholesterol have not been found to have a high incidence of atherosclerosis or coronary heart disease. Keys has received ample supporting evidence from other investigators working with different racial groups and with similar races who have widely differing dietary habits.[30,31] Although this hypothesis is highly attractive it cannot be regarded as proved, since many factors may influence populations and their vital statistics. Such factors include type of dietary fat, amount of protein in the diet, total caloric intake, environmental surroundings, and various stress features. In addition the problems concerned with case selection, analysis of mortality records, and validity of diet studies work together against complete acceptance of this thesis.

For those who believe that blood coagulation and vascular thrombosis are important in the etiology of coronary disease, there is evidence to suggest that lipid metabolism has an important influence on these factors. Coagulation appears to be enhanced by alimentary lipemia and by increased concentrations of the various lipid fractions in the blood.[32] As yet, work in this field—especially the standardization and reproducibility of techniques for measuring coagulation—is not sufficient for firm conclusions.

From even this brief survey concerning the causation of atherosclerosis, I believe it is fair to say that altered lipid metabolism as manifested by elevated concentrations of cholesterol in the blood is a very important etiologic factor in atherogenesis, but that it is not the only one. Atherosclerosis is a complex result of many factors of varying influence. Despite the considerable lack of knowledge concerning atherogenesis, it seems worth while even now to do all we can to try to influence favorably a disease process of such supreme importance. Consequently, patients with hypercholesteremia should be considered for treatment designed to decrease the concentration of lipids in the blood, even though we do not yet have proof that such therapy has any beneficial effect upon the course of atherosclerosis.

Evaluation of Blood Tests for Abnormal Lipid Metabolism

Unfortunately the clinical recognition of early atherosclerosis is very difficult or impossible, and ordinarily must await some serious overt manifestation which is the result of arterial obstruction. By this time atherosclerosis usually is well established and may be in a stage which is irreversible. Because of these circumstances a wide variety of blood tests and indices have been advanced as means of detecting early or potential atherosclerosis. The physician now is confronted with numerous reports of evidence that this test or that index is the best guide to early recognition of the "atherosclerosis-prone patient." Such multiplicity of procedures implies that no one test is highly satisfactory.

The usual determinations of serum or plasma lipids which are available to the physician include: (1) total cholesterol; (2) phospholipids—and from these first two tests the cholesterol/phospholipid ratio is calculated; (3) fatty acids or triglycerides; (4) total blood lipids; (5) alpha and beta lipoprotein cholesterol—and their ratio can be obtained by paper electrophoresis; and (6) the "atherogenic index" as derived from analysis of serum lipoproteins by the ultracentrifugation technique developed by Gofman and his group[33] at the Donner Laboratories in California.

A great deal of study has been devoted to evaluating and comparing the merits of these various procedures. At the present time it seems a majority opinion that an accurate value for total serum or plasma cholesterol is as good or better an index of lipid metabolism as the results of other more complex tests.[34] In Mayo Clinic experience as well as in that of other investigators, it has been found that when significant changes occur in the concentration of serum cholesterol the other lipid values usually change in the same direction and in approximately the same degree. This is indeed fortunate, because determination of cholesterol is simpler and less expensive than are the other tests of lipid metabolism, and the service is more readily available in most parts of the country. In addition, more information involving more people over longer periods is known about blood cholesterol than about the findings from any other single test of lipid metabolism. If one must admit that even now the significance of an elevated cholesterol value for an individual patient is not certain, it follows that results from other, less widely studied tests will be even more equivocal.

The decision as to what constitutes normal values for cholesterol is usually dependent upon the specific technique and laboratory. In many laboratories a cholesterol concentration of 250 mg. per 100 ml. of serum is considered the upper limit of normal. This figure is derived from examination of many apparently healthy American adults. Almost surely this value is too high, for it can be assumed that some of these control adults had atherosclerosis or potential for developing the disease which was not yet evident. In addition, age and sex may cause important variations in "normal" values for serum cholesterol.[35] Even in the same individual there may be quite wide physiologic fluctuations during a period of observation without any obvious influencing factors being present. This variability and the eternal problem of laboratory error necessitate constant vigilance and astute discrimination by the physician in the interpretation of serum cholesterol values.[36]

Selection of Patients for Treatment

Thus far, two conclusions have been offered: first, that it is probably desirable to treat patients with abnormal lipid metabolism if this can be done conveniently and safely; and second, that the total blood cholesterol is regarded as the most practical of blood-test factors to assist in selecting patients for treatment and in assessing their progress. Now, how is the clinician to recognize these patients with hypercholesteremia? This really comes down to deciding which patients should have their blood cholesterol checked.

To begin with, an increasing number of patients request a cholesterol determination. Also, a number of patients are without symptoms but have regular examinations in which the physician includes the cholesterol determination routinely. Under either circumstance, positive findings are purely fortuitous.

A second group is composed of patients who have diseases or lesions which are commonly associated with elevated blood cholesterol values. (In this presentation vascular diseases are considered separately.) Persons with xanthelasma frequently have hypercholesteremia.[37] Cutaneous xanthoma nearly always indicates elevated concentrations of blood lipids, and the same is true concerning xanthomas of the tendons.[38] A prominent arcus senilis,

especially in younger persons, may offer a clue to hypercholesteremia.[38] Many patients with diabetes and myxedema have high concentrations of serum cholesterol. Occasionally upon examination of the ocular fundi lipemia retinalis is observed, and then invariably all blood lipids are found to be markedly elevated. Another means for identifying patients with hypercholesteremia is the examination of any turbid serum or plasma noted when the specimen is being used for some other test. Although lactescence of serum is not always accompanied by marked elevations in concentration of cholesterol. this occurs frequently enough to warrant full examination of all lipid components.

A third group who should be examined for hypercholesteremia might be termed "patients with vascular disease or potential vascular disease." This includes patients with overt coronary, cerebral, or peripheral atherosclerosis, particularly in the younger age ranges. Those persons who are asymptomatic but have a strong family history of vascular disease and death at early ages should have periodic determinations of blood cholesterol.

At the clinic, selection is made from these three groups on the basis of cholesterol values exceeding 250 mg./100 ml. of blood. Before treatment is initiated a second determination is made and perhaps a third, for it is important that the increased concentration of cholesterol not be a chance transient fluctuation or laboratory error. In assessing response to treatment, frequent determinations of cholesterol in the blood over prolonged periods are essential; and success is proved only by significant and sustained reduction. At the present time I do not attempt to lower further the cholesterol of patients whose values are within the normal range, even if they have overt atherosclerosis. A change in this decision awaits further knowledge concerning the etiology of atherogenesis. Again it must be stated clearly that present information does not afford definite proof that maintenance of normal or low concentrations of blood cholesterol prevents or mitigates atherosclerosis.

Treatment of Hypercholesteremia

In discussing treatment of hypercholesteremia I shall speak only of methods for securing and maintaining more normal concentrations of cholesterol in the patient's blood, and shall not include such therapy as may be indicated for the sequelae of atherosclerotic vascular disease.

Dietary Measures

Diets Low in Fat.—The first measure to consider is the oldest, simplest, and probably most physiologic—that is, diets which restrict fat intake. While new ideas have influenced thinking regarding low-fat diets, this form of therapy remains the cornerstone. If the patient with hypercholesteremia is obese, the obvious first measure is reduction of weight. A significant number of such patients achieve a good lowering of blood fats by merely attaining a proper weight, and some of these continue to have normal lipid values as long as they maintain the desired weight.[39] Unfortunately, others regain elevated cholesterol levels even though they remain at a desired weight. In these resistant patients and in those persons with elevated cholesterol who are not obese, the diet then must be restricted in fat content. Instead of the usual 40 per cent or more of the total caloric intake being supplied by fat, this amount must be reduced to 25 per cent or less.[40] Such a degree of fat restriction can be followed without extreme difficulty. and a number of patients show a satisfactory response to this therapy. For those who do not respond adequately, diets may be tried in which less than 15 per cent of the calories are furnished by fat. Such diets are very difficult to adhere to for long periods, especially if the patient is engaged in considerable physical labor. Then, too, such a program is not always successful even when it is strictly followed.

Spaced Fat Feeding.—For patients with familial hyperlipemia Wilkinson[41] has recommended that fat be excluded from the morning and noon meals but that the evening meal contain a normal quantity of it. The rationale is that with ingesting fat only once a day sufficient time will be furnished for adequate metabolism before a further increment of fat is added. This regimen is based on the thesis that some hyperlipemic patients can handle fats satisfactorily if given more time between periods of fat ingestion, and thus avoid a gradual build-up in concentration of lipids in the blood over a prolonged period. As yet, experience with this treatment is inadequate to permit definite conclusions; but it may offer a practical means of obtaining more normal levels of blood lipids in selected patients.

Unsaturated Fatty Acids.—This brings up the problem regarding types of fat in the diet. A considerable mass of data indicates that ingestion

of animal or dairy fats causes the elevation in blood lipids. These fats contain mostly saturated fatty acids which may have low iodine numbers. When such fats are restricted and the amount of fat from vegetable or some marine sources is increased, frequently a desirable lowering of elevated cholesterol ensues[42]. These "good fats" are rich in unsaturated fatty acids which contain the so-called "essential fatty acids" and tend to have high iodine numbers. Some workers believe that the ratio of saturated to unsaturated fatty acids is the important factor in determining whether the diet will be successful in decreasing elevated blood lipids. The greater the ratio of unsaturates to saturates, the better is the effect on lipids; a ratio of 3 or 4 to 1 seems quite effective.[43] At this time the precise action of unsaturated fatty acids is unknown.

What does this mean from a practical therapeutic standpoint? Experiences at the Mayo Clinic[44] as well as elsewhere[45] have shown that merely adding concentrated amounts of unsaturated fatty acids to the average American diet is not effective in lowering cholesterol. In addition, this regimen furnishes a large number of extra calories and makes it difficult to avoid gain of weight. Hence to be effective the amount of saturated fat in the diet must be restricted to approximately 20 per cent of total calories derived from fat. The remaining 80 per cent are derived from unsaturated fats. A number of cookbooks and diet lists now available offer excellent suggestions for regimens of this type. Although for success in lowering blood cholesterol it is necessary to adhere closely to specific diets that have rather marked restriction of animal and dairy fat, in practice many patients simply will not adhere to such diets for long periods.

Dietary Cholesterol.—Most opinion holds that in man the concentration of serum cholesterol is virtually unrelated to the intake of cholesterol in the diet[46] and that no rigid restriction is needed. Although this view may be accepted as a generalization there is some evidence to the contrary.[47] For the present, however, one need not be concerned about the actual amounts of cholesterol in the "low-fat diets" which have been suggested for diminishing blood lipids.

Exercise

It is probable that increase of physical effort causes a slight decrease of plasma cholesterol.[21] Hence a program of greater physical activity seems worth while in selected patients if not otherwise contraindicated. Exercise is not adequate as the only measure for lowering elevated concentrations of serum cholesterol, but seems useful when combined with other measures, especially restriction on total intake of saturated fats.[48]

Drug Therapy for Hypercholesteremia

Most physicians are acquainted with the difficulty in having patients adhere to diets which vary appreciably from those to which they have become accustomed. This pertains in great measure to diets which restrict fat, especially saturated fats derived from animal or dairy sources. In an effort to surmount this very considerable practical obstacle much investigation has been directed toward drug therapy of hypercholesteremia, and the search for safe, effective, and practical hypocholesteremic agents goes on apace; for it is well known that many patients will take medicines readily rather than diet. Although much has been achieved, the goal has not been attained as yet; and reports concerning such drugs are still to be considered investigational. Nevertheless, since interest in this endeavor is very great—extending even beyond the medical profession—it is desirable that all physicians be familiar with work that is being done.

Estrogens.—The use of estrogens to reduce elevated concentrations of blood lipids has been and is being studied intensively. There is little doubt that estrogens cause a moderate decrease of blood cholesterol in many patients,[49] and that the hormone protects against experimental atherosclerosis in animals.[50] As yet it has not been established that treatment with estrogens will influence favorably survival rates of patients having coronary atherosclerosis.[51]

Ordinarily, large doses of estrogens—from 0.2 to 2.0 mg. daily of ethinyl estradiol or its equivalent—are needed for a satisfactory hypocholesteremic response in men. These large amounts may not be necessary in postmenopausal women or in younger women with loss of ovarian function.[15] In men, therapy with estrogens has been limited by the production of gynecomastia, loss of libido, and testicular atrophy. In women, uterine bleeding may be a problem. These side effects have prompted considerable effort to develop an estrogenic substance which will lower blood cholesterol but have only minimal feminizing effects. Thus

far such an ideal compound has not been forthcoming, although some headway has been made.[52,53]

Thyroid.—Thyroid extract, thyroxine, and triiodothyronine have been used to lower concentrations of blood cholesterol in euthyroid patients.[51,54] Although some success has been achieved with these medications, large doses are required—from 4 to 6 grains daily of thyroid extract or its equivalent. Most workers have encountered evidence that such large doses may be dangerous for patients with overt or latent coronary-artery disease by increasing the degree of coronary insufficiency. In recognition of this hazard a considerable effort has been made to develop thyroid analogues which retain the hypocholesteremic effect but do not possess the calorigenic feature. At the present time this desired result has not been attained.[51,55] It is suggested that only modest doses of thyroid extract (½ to 2 grains daily) be employed for treatment of hypercholesteremia and that other measures be added as necessary to achieve a satisfactory therapeutic response.

Sitosterol.—Plant sterols, especially beta sitosterols, have been advocated for the treatment of hypercholesteremia. It is thought that these presumably inert sterols, which are structurally similar to cholesterol, compete with cholesterol for absorption in the gut. The resulting decrease in the amount of biliary and ingested cholesterol absorbed from the intestine lowers the concentration of cholesterol in the blood.[56] The drug, commercially available as cytellin, is taken as a liquid in amounts of about 1 ounce with each meal or intake of food. Most experience with sitosterol shows that it has a slight to moderate cholesterol-lowering effect with an occasional very good response.[44,57] However, some investigators have been unable to demonstrate any significant or sustained effect.[58] Sitosterol, although apparently harmless, is somewhat of a nuisance to take, has a chalky taste, and is expensive. It seems doubtful whether the modest lipid-lowering ability of sitosterol compensates for the disadvantages in its long-term use, but this agent may be helpful as an adjunct to other drug or diet therapy in resistant cases.

Nicotinic Acid.—The treatment of hypercholesteremia with large amounts of nicotinic acid has been studied with considerable interest since first reported in 1955.[59] The drug is given orally thrice daily after meals in doses varying from 0.5 to 2.0 gm. for a total of 1.5 to 6.0 gm. per day. Ordinarily no changes are made in the customary diet of the patients. This therapy has achieved significant, reproducible, sustained reductions in the concentration of cholesterol and other lipid components of the blood.[60,61] Also, a direct relationship between dose and effect is evident when the amount of nicotinic acid is increased or decreased. By use of adequate amounts of the drug, normal values for plasma cholesterol have been obtained and maintained in three fourths of Mayo Clinic patients in whom it was tried.[60] The mechanism by which nicotinic acid decreases levels of cholesterol in the blood is not yet known.

Side effects consist chiefly of cutaneous flushing and pruritus which are severe initially but usually subside within 10 days. Anorexia and nausea may be troublesome also. Occasionally abnormalities in tests of liver function and rarely a case of jaundice have been observed during therapy with nicotinic acid.[55,62] Impairment of glucose tolerance and increases in serum uric acid are seen in many patients receiving treatment.[55] These metabolic effects are not well understood; they call for more intensive study. Although nicotinic acid appears very effective and practical, this use of the drug must be considered an investigative procedure until its safety is definitely established.

Anticoagulants. — In addition to their anticoagulant effects, heparin and bishydroxycoumarin (dicumarol) have been used in patients with coronary disease and hyperlipemia because of their lipemia-clearing abilities. This therapy tends to eliminate the propensity for increased clotting which has been observed *in vivo* following alimentary lipemia.[32,63] However, there is no satisfactory evidence at present that these anticoagulants lower cholesterol appreciably over long periods or prevent the development of atherosclerosis. Hence their use for this purpose cannot be recommended except on an experimental basis.

Pyridoxine and Lecithin.—Data regarding the value of pyridoxine[64] and lecithin[65] in treatment of hypercholesteremic patients is too meager to evaluate at this time.

Lipotropic Agents.—Lipotropic substances such as choline, methionine, and inositol are mentioned only to reject them. There is no acceptable evidence that these drugs are effective in lowering levels of blood lipids or in the treatment or prevention of atherosclerosis.

Inhibitors of Cholesterol Biosynthesis.—Considerable recent investigation has been concerned with agents which interfere with the usual hepatic synthesis of cholesterol. This work is still experimental but preliminary reports are interesting. Certain vanadium compounds[66] appear to be effective in lowering cholesterol, as is a derivative of ethanol, triparanol (MER-29[67]). Much remains to be learned about these drugs but it is certain that this approach to the treatment of hypercholesteremia will be studied intensively.

Summary

A brief survey of the evidence linking disturbed lipid metabolism and atherosclerosis has been presented. Although much information is necessary to fill gaps in the etiology of atherogenesis, it is reasonable even now to attempt correction of altered lipid metabolism whenever this can be done safely. At present a number of therapeutic measures are available to the physician who wishes to accept the responsibility for treatment of patients with hypercholesteremia, and there is good reason to believe that even more effective treatment will be the reward of continuing research in the field of lipid metabolism and atherosclerosis.

References

1. Virchow, R.: Quoted by Long, E. R.: The development of our knowledge of arteriosclerosis. *In* Cowdry, E. V.: Arteriosclerosis: A Survey of the Problem. P. 40. New York: The Macmillan Company, 1933.
2. Buck, R. C., and Rossiter, R. J.: Lipids of normal and atherosclerotic aortas: A chemical study. AMA Arch. Path., 51:224-237 (Feb.) 1951.
3. Weinhouse, Sidney, and Hirsch, E. F.: Chemistry of atherosclerosis. I. Lipid and calcium content of intima and of the media of the aorta with and without atherosclerosis. Arch. Path., 29:31-41 (Jan.) 1940.
4. Faber, Mogens: The cholesterol content of the human aorta in relation to the serum cholesterol concentration. Acta med. scandinav., 125:418-427, 1946.
5. Tuna, Naip, Recters, Lois, and Frantz, I. D., Jr.: The fatty acids of normal plasma and arteriosclerotic plaques. J. Clin. Invest., 36:932 (June) 1957.
6. Biggs, M. W., Kritchevsky, D., Colman, D., Gofman, J. W., Jones, H. B., Lindgren, F. T., Hyde, G., and Lyon, T. P.: Observations on the fate of ingested cholesterol in man. Circulation, 6:359-366 (Sept.) 1952.
7. Enos, W. F., Holmes, R. H., and Beyer, James: Coronary disease among United States soldiers killed in action in Korea. J.A.M.A., 152:1090-1093 (July 18) 1953.
8. Corcoran, A. C., Page, I. H., Dustan, Harriet P., and Lewis, Lena A.: Atherosclerotic complications of hypertensive disease: Relation to therapeutic response and to serum protein and to lipoprotein concentrations: Preliminary report. Cleveland Clin. Quart., 23:115-123 (Apr.) 1956.
9. Anitschow, N., and Chalatow, S.: Quoted by Anitschow, N.: Experimental arteriosclerosis in animals. *In* Cowdry, E. V.: Arteriosclerosis: A Survey of the Problem. Pp. 271-322. New York: The Macmillan Company, 1933.
10. Duff, G. L., and McMillan, G. C.: Pathology of atherosclerosis. Am. J. Med., 11:92-108 (July) 1951.
11. Hartroft, W. S., and Thomas, W. A.: Pathological lesions related to disturbances of fat and cholesterol metabolism in man. J.A.M.A., 164:1899-1905 (Aug. 24) 1957.
12. Lawry, Eleanor Y., Mann, G. V., Peterson, Ann, Wysocki, Alice P., O'Connell, Rita, and Stare, F. J.: Cholesterol and beta lipoproteins in the serums of Americans: Well persons and those with coronary heart disease. Am. J. Med., 22:605-623 (Apr.) 1957.
13. Page, I. H.: Predictive value of lipoprotein measurements in coronary atherosclerosis: Guest editorial. J.A.M.A., 163:454-455 (Feb. 9) 1957.
14. Oliver, M. F., and Boyd, G. S.: Effect of bilateral ovariectomy on coronary-artery disease and serum lipid levels. Lancet, 2:690-694 (Oct. 31) 1959.
15. Marmorston, Jessie, Magidson, Oscar, Lewis, J. J., Mehl, John, Moore, F. J., and Bernstein, Jacob: Effect of small doses of estrogen on serum lipids in female patients with myocardial infarction. New England J. Med., 258:583-586 (Mar. 20) 1958.
16. Dock, William: Why are men's coronary arteries so sclerotic? J.A.M.A., 170:152-156 (May 9) 1959.
17. Society of Actuaries, Impairment Study, 1951 (April, 1954): Quoted by Page, I. H., Stare, F. J., Corcoran, A. C., Pollack, Herbert, and Wilkinson, C. F., Jr.: Atherosclerosis and the fat content of the diet. Circulation, 16:163-178 (Aug.) 1957.
18. Thomas, Caroline: Familial patterns in hypertension and coronary heart disease. Circulation, 20:25-29 (July) 1959.
19. Adlersberg, David: Inborn errors of lipid metabolism: Clinical, genetic, and chemical aspects. AMA Arch. Path., 60:481-492 (Nov.) 1955.
20. Morris, J. N.: Occupation and coronary heart disease. AMA Arch. Int. Med., 104:903-907 (Dec.) 1959.
21. Mann, G. V., Teel, Katherine, Hayes, Olive, McNally, Ann, and Bruno, Dorothy: Exercise in the disposition of dietary calories: Regulation of serum lipoprotein and cholesterol levels in human subjects. New England J. Med., 253:349-355 (Sept. 1) 1955.
22. Grundy, S. M., and Griffin, A. C.: Relationship of periodic mental stress to serum lipoprotein and cholesterol levels. J.A.M.A., 171:1794-1796 (Nov. 28) 1959.
23. Friedman, Meyer, Rosenman, R. H., and Carroll, Vernice: Changes in the serum cholesterol and blood clotting time in men subjected to cyclic variation of occupational stress. Circulation. 17:852-861 (May) 1958.
24. Russek, I. H.: Role of heredity, diet, and emotional stress in coronary heart disease. J.A.M.A., 171:503-508 (Oct. 3) 1959.
25. Groom, Dale, McKee, E. E., Webb, Charles, Grant, Faye W., Pean, Vergniaud, and Hudicourt, Edith: A comparative study of coronary disease in Haitian and American Negroes. South. M. J., 52:504-510 (May) 1959.
26. Aschoff, Ludwig: Lectures on Pathology. P. 143. New York: Paul B. Hoeber, Inc., 1924.
27. Strøm, Axel, and Jensen, R. A.: Mortality from circulatory diseases in Norway, 1940-1945. Lancet, 1:126-129 (Jan. 20) 1951.
28. Morris, J. N.: Fats and disease: Letter to the editor. Lancet, 1:687-689 (May 12) 1956.
29. Keys, Ancel: Coronary heart disease and the mode of life. Mod. Concepts Cardiovas. Dis., 25:317-320 (Mar.) 1956.

30. Bronte-Stewart, B., Keys, A., and Brock, J. F.: Serum-cholesterol, diet, and coronary heart disease: An inter-racial survey in the Cape Peninsula. Lancet, 2:1103-1108 (Nov. 26) 1955.
31. Larsen, N. P.: The animal fat diet and atherosclerosis. Hawaii M. J.. 14:485-490 (July-Aug.) 1955.
32. Mustard, J. F.: Increased activity of the coagulation mechanism during alimentary lipaemia: Its significance with regard to thrombosis and atherosclerosis. Canad. M. A. J., 77:308-314 (Aug. 15) 1957.
33. Gofman, J. W., Jones, H. B., Lyon, T. P., Lindgren, Frank, Strisower, Beverly, Colman, David, and Herring, Virgil: Blood lipids and human atherosclerosis. Circulation, 5:119-134 (Jan.) 1952.
34. Gofman, J. W., Hanig, Martin, Jones, H. B., Lauffer, M. A., Lawry, Eleanor, Lewis, Lena A., Mann, G. V., Moore, F. E., Olmsted, Frederick, Yeager, J. F., and Committee on Lipoproteins and Atherosclerosis of the National Advisory Heart Council: Evaluation of serum lipoprotein and cholesterol measurements as predictors of clinical complications of atherosclerosis: Report of a cooperative study of lipoproteins and atherosclerosis. Circulation, 14:691-725 (Oct.) 1956.
35. Keys, Ancel, Mickelsen, Olaf, Miller, Erma V., Hayes, E. R., and Todd, Ramona L.: The concentration of cholesterol in the blood serum of normal man and its relation to age. J. Clin. Invest., 29: 1347-1353 (July-Dec.) 1950.
36. Rivin, A. U., Yoshino, Josephine, Shickman, Martin, and Schjeide, O. A.: Serum cholesterol measurement —Hazards in clinical interpretation. J.A.M.A., 166: 2108-2111 (Apr. 26) 1958.
37. Vacca, J. B., Knight, W. A., Jr., and Broun, G. O., Sr.: Clinical observations regarding xanthelasma. Ann. Int. Med., 51:1019-1031 (Nov.) 1959.
38. Piper, Jørgen, and Orrild, Lis: Essential familial hypercholesterolemia and xanthomatosis: Follow-up study of twelve Danish families. Am. J. Med., 21:34-46 (July) 1956.
39. Walker, W. J.: Relationship of adiposity to serum cholesterol and lipoprotein levels and their modification by dietary means. Ann. Int. Med., 39:705-716 (Oct.) 1953.
40. Stare, F. J., Van Itallie, T. B., McCann, Mary, and Portman, O. W.: Nutritional studies relating to serum lipids and atherosclerosis: Therapeutic implications. J.A.M.A., 164:1920-1926 (Aug. 24) 1957.
41. Wilkinson, C. F., Jr.: Drugs other than anticoagulants in treatment of arteriosclerotic heart disease. J.A.M.A., 163:927-930 (Mar. 16) 1957.
42. Ahrens, E. H., Jr., Hirsch, Jules, Insull, William, Jr., Tsaltas, T. T., Blomstrand, Rolf, and Peterson, M. L.: The influence of dietary fats on serum-lipid levels in man. Lancet, 1:943-953 (May 11) 1957.
43. Kinsell, L. W., Michaels, G. D., Friskey, R. W., and Splitter, Stanford: Essential fatty acids, lipid metabolism, and atherosclerosis. Lancet, 1:334-339 (Feb. 15) 1958.
44. Berge, K. G., Achor, R. W. P., Barker, N. W., and Power, M. H.: Comparison of the treatment of hypercholesteremia with nicotinic acid, sitosterol and safflower oil. Am. Heart J., 58:849-853 (Dec.) 1959.
45. Perkins, Richard, Wright, I. S., and Gatje, Barbara: Effect of safflower oil emulsion on serum cholesterol levels in young adult males: Its use as a supplement to a normal diet. J.A.M.A., 166:2132-2135 (Apr. 26) 1958.
46. Taylor, C. B., and Gould, R. G.: Effect of dietary cholesterol on rate of cholesterol synthesis in the intact animal measured by means of radioactive carbon. (Abstr.) Circulation, 2:467-468 (Sept.) 1950.
47. Beveridge, J. M. R., Connell, W. F., Haust, H. L., and Mayer, G. A.: Dietary cholesterol and plasma cholesterol levels in man. Canad. J. Biochem. & Physiol., 37:575-582 (Apr.) 1959.
48. Taylor, H. L.: Diet, physical activity and the serum cholesterol concentration. Minnesota Med., 41:149-153; 170 (Mar.) 1958.
49. Barr, D. P.: Hormonal factors in the pathogenesis of atherosclerosis. Minnesota Med., 38:788-793 (Nov.) 1955.
50. Stamler, J., Pick, R., and Katz, L. N.: Experiences in assessing estrogen antiatherogenesis in the chick, the rabbit, and man. Ann. New York Acad. Sc., 64:596-619 (Nov. 16) 1956.
51. Oliver, M. F., and Boyd, G. S.: Thyroid and estrogen treatment of hypercholesterolemia in man. *In:* Pincus, George: Hormones and Atherosclerosis. Pp. 403-418. New York: Academic Press, Inc., 1959.
52. Davis, F. W., Jr., Scarborough, W. R., Mason, R. E., Singewald, M. L., and Baker, B. M., Jr.: Experimental hormonal therapy of atherosclerosis: Preliminary observations on the effects of two new compounds. Am. J. M. Sc., 235:50-59 (Jan.) 1958.
53. Christensen, N. A., Achor, R. W. P., Berge, K. G., Barker, N. W., and Power, M. H.: Unpublished data.
54. Strisower, Beverly, Gofman, J. W., Galioni, E. F., Rubinger, J. H., Pouteau, Jean, and Guzvich, Peter: Long-term effect of dried thyroid on serum-lipoprotein and serum-cholesterol levels. Lancet. 1:120-123 (Jan. 19) 1957.
55. Berge, K. G., Achor, R. W. P., Christensen, N. A., Barker, N. W., and Mason, H. L.: Unpublished data.
56. Gould, R. G.: Section of Biology: Symposium on sitosterol. IV. Absorbability of beta-sitosterol. Tr. New York Acad. Sc., s.2 18:129-134 (Dec.) 1955.
57. Best, M. M., and Duncan, C. H.: Modification of abnormal serum lipid patterns in atherosclerosis by administration of sitosterol. Ann. Int. Med., 45:614-622 (Oct.) 1956.
58. Levere, A. H., Bozian, R. C., Craft, G., Jackson, R. S., and Wilkinson, C. F., Jr.: The "sitosterols": variability of serum cholesterol levels and difficulty of evaluating decholesterolizing agents. Metabolism. 7:338-348 (July) 1958.
59. Altschul, Rudolf, Hoffer, Abram, and Stephen, J. D.: Influence of nicotinic acid on serum cholesterol in man. Arch. Biochem., 54:558-559 (Feb.) 1955.
60. Achor, R. W. P., and Berge, K. G.: Treatment of hypercholesteremia with large oral doses of nicotinic acid: Further investigations. M. Clin. North America. Pp. 871-880 (July) 1958.
61. Parsons, W. B., Jr., and Flinn, J. H.: Reduction of serum cholesterol levels and beta-lipoprotein cholesterol levels by nicotinic acid. AMA Arch. Int. Med., 103:783-790 (May) 1959.
62. Rivin, A. U.: Jaundice occurring during nicotinic acid therapy for hypercholesteremia. J.A.M.A., 170: 2088-2089 (Aug. 22) 1959.
63. Council on Drugs: Use of heparin sodium in hyperlipemia. J.A.M.A., 166:52-53 (Jan. 4) 1958.
64. Schroeder, H. A.: Is atherosclerosis a conditioned pyridoxal deficiency? J. Chron. Dis., 2:28-41 (July) 1955.
65. Morrison, L. M.: Serum cholesterol reduction with lecithin. Geriatrics, 13:12-19 (Jan.) 1958.
66. Curran, G. L., Azarnoff, D. L., and Bolinger, R. E.: Effect of cholesterol synthesis inhibition in normocholesteremic young men. J. Clin. Invest., 38:1251-1261 (July) 1959.
67. Oaks, Wilbur, Lisan, Paul, and Moyer, J. M.: Inhibition of cholesterol synthesis with the use of Mer-29. AMA Arch. Int. Med., 104:527-531 (Oct.) 1959.

Neuromuscular Syndrome

After Electrolyte Disturbance and Severe Acidosis

Treatment with the Artificial Kidney

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SEVERE and prolonged acidosis, associated with electrolyte disturbances, may produce a neuromuscular syndrome characterized by paralysis of the extremities, the diaphragm, and the intercostal muscles. The syndrome may persist after correction of the apparent chemical cause, evidently because neurocellular damage has been established. The possibility of neurocellular damage should make us strive for correction of acidosis rather than for supportive therapy only. Unfamiliarity with the neurologic syndrome may lead to useless neurosurgical exploration in order to rule out organic brain damage.

The following case reports illustrate the syndrome in patients with acidosis due to various causes: diabetic acidosis, uremia, and salicylate intoxication. Two patients were treated with the artificial kidney; the other was not.

Case Reports

Case 1. (Fig. 1).*—A woman, aged thirty-one, in diabetic acidosis and acute renal failure was referred to us. Five days prior to admission, she experienced backache in the lumbar area, dyspnea, and increased thirst. One day before admission, she was taken to another hospital in precoma diabeticum. The blood sugar was 590 mg. per 100 ml., and the HCO_3 content was 9 mEq. per liter. The urine contained albumin (3 plus), glucose, and acetone. She was given 3,000 units of crystalline insulin within twenty-one hours and was given fluids intravenously. The blood sugar decreased to 100 mg. per 100 ml. She became hypotensive and oliguric.

Upon admission to the Cleveland Clinic Hospital, the patient was hypotensive, had a rapid pulse, and was pale and lethargic. The findings on physical examination were otherwise normal. She did not have edema, and muscular strength was normal. She was in a state of acidosis: the serum HCO_3 concentration was 8.6 mEq. per liter (Fig. 1), and the pH of blood drawn from the femoral vein was 7.28. Neither sugar nor acetone was present in the urine at this time. The respirations were deep but not excessively rapid. Electrocardiographic changes were consistent with hypokalemia, and the serum potassium concentration was 2.8 mEq. per liter. She was treated conservatively with sodium lactate, potassium chloride, and insulin, and was given fluids as required. The next day the serum HCO_3 concentration was 14.2 mEq. per liter.

Four days later, although her blood sugar was controlled with insulin and there was no acetone in the urine, the acidosis was improving only slowly: the serum HCO_3-concentration was 18.4 mEq. per liter. Her blood urea concentration continued to rise to 158 mg. per 100 ml.; the serum potassium concentration was 3.0 mEq. per liter. Her urinary output increased. At that time we first noticed progressive weakness of the legs and also weakness of the facial muscles. On the fifth day of hospitalization at the Cleveland Clinic Hospital, she

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*This case was reported by R. R. Ozker; N. G. Richards, and O. P. Schumacher in the *Ohio State Medical Journal*, 55:1521-1522 (Nov.) 1959.

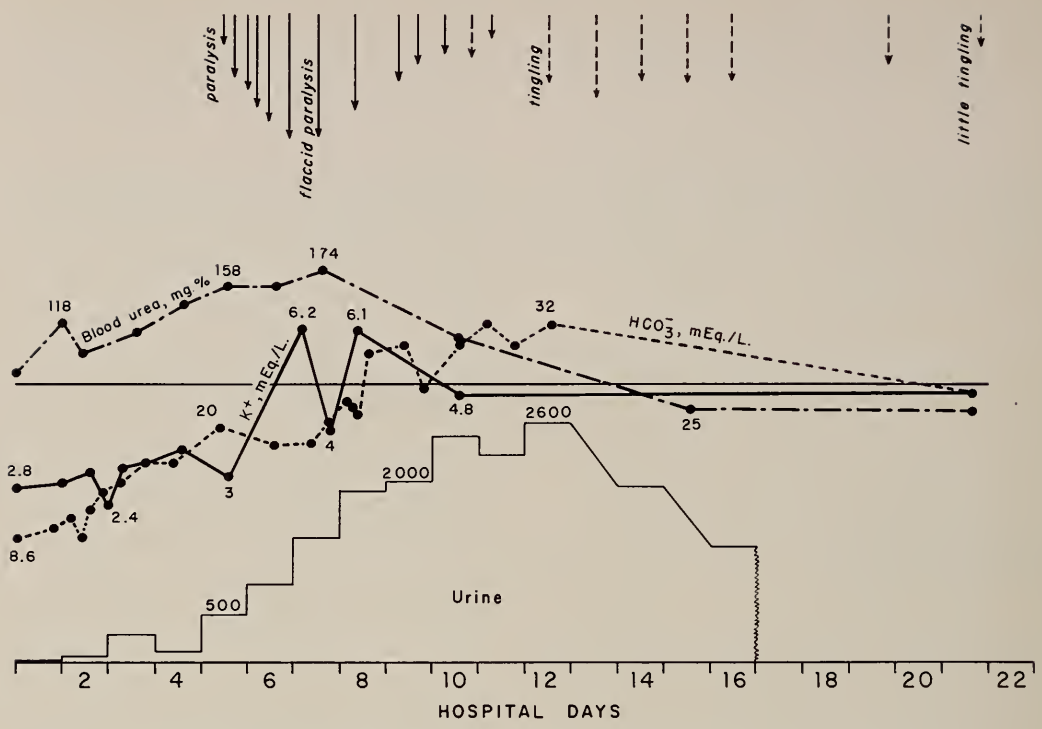


Fig. 1. A woman, aged thirty-one, with a diabetic coma presented a neuromuscular syndrome characterized by paralysis and tingling sensation of extremities. This syndrome persisted after a correction of electrolyte imbalance, especially of serum potassium.

presented extreme muscular weakness, predominantly in the proximal muscle groups, and more in the legs than in the shoulders. Diplopia was disclosed by a red lens test. Deep tendon reflexes were absent. Neither muscular tenderness nor fasciculations were present. Respirations were shallow and rapid and were performed with auxiliary muscles. Although it was not proved roentgenographically, diaphragmatic respiration did not seem to be effective. A respirator was kept ready for use nearby, but it was not needed.

On the sixth day, weakness of the sphincters of the bladder and rectum developed. On the seventh day, when the neuromuscular syndrome was most severe, laboratory studies disclosed: pH of the blood 7.4, serum HCO_3-concentration 22 mEq. per liter, blood urea 174 mg. per 100 ml.; the serum potassium varied between 4 and 6.2 mEq. per liter (Fig. 1). The fluctuations in the serum potassium concentration were caused by attempts to bring it under control by the administration of potassium and of potassium-binding resins. The blood sugar concentration was well under control, varying between 90 and 120 mg. per 100 ml. The cerebrospinal fluid was xanthochromic and the protein concentration was elevated to 280 mg. per 100 ml. An electromyogram showed changes consistent with fasciculations in the left deltoid muscle. The electromyograms of other muscles tested were normal. Tingling in the extremities began on the tenth day, but otherwise the neuromuscular syndrome slowly reversed.

On the twenty-sixth day the patient was discharged. There was still tingling of the fingers. The concentrations of serum electrolytes and of blood urea were normal, and the diabetes was well controlled.

Comment.—The neuromuscular syndrome appeared at the time that the acidosis was improving and it persisted after the concentrations of potassium and of other electrolytes were corrected. Acidosis was the most prominent abnormality found in laboratory studies, but the serum potassium concentration was also low (3 mEq. per liter during the paralysis, 2.4 before). The persistence of symptoms and the finding of excess protein in the cerebrospinal fluid indicate that the severe chemical disturbance may have led to neurocellular damage.

Case 2. (Fig. 2).—A Negro boy, aged fifteen, in renal failure with massive edema was referred to us. He lost 40 pounds in weight within a five-month period and backaches, weakness, and anorexia developed. Three weeks prior to admission, oliguria gradually set in and generalized edema developed. No history of sore throats or of other infections was reported.

Upon admission, the patient was lethargic; he had generalized weakness and flaccid paralysis of the arms and legs. His respirations were shallow. Severe generalized edema, oliguria, and ascites were present. The most significant laboratory findings were: serum HCO_3-concentration 10.4 mEq. per liter, serum potassium 8.6 mEq. per liter, blood urea 432 mg. per 100 ml., blood creatinine 22.2 mg. per 100 ml., and anemia. The blood sugar was normal: 85 mg. per 100 ml.

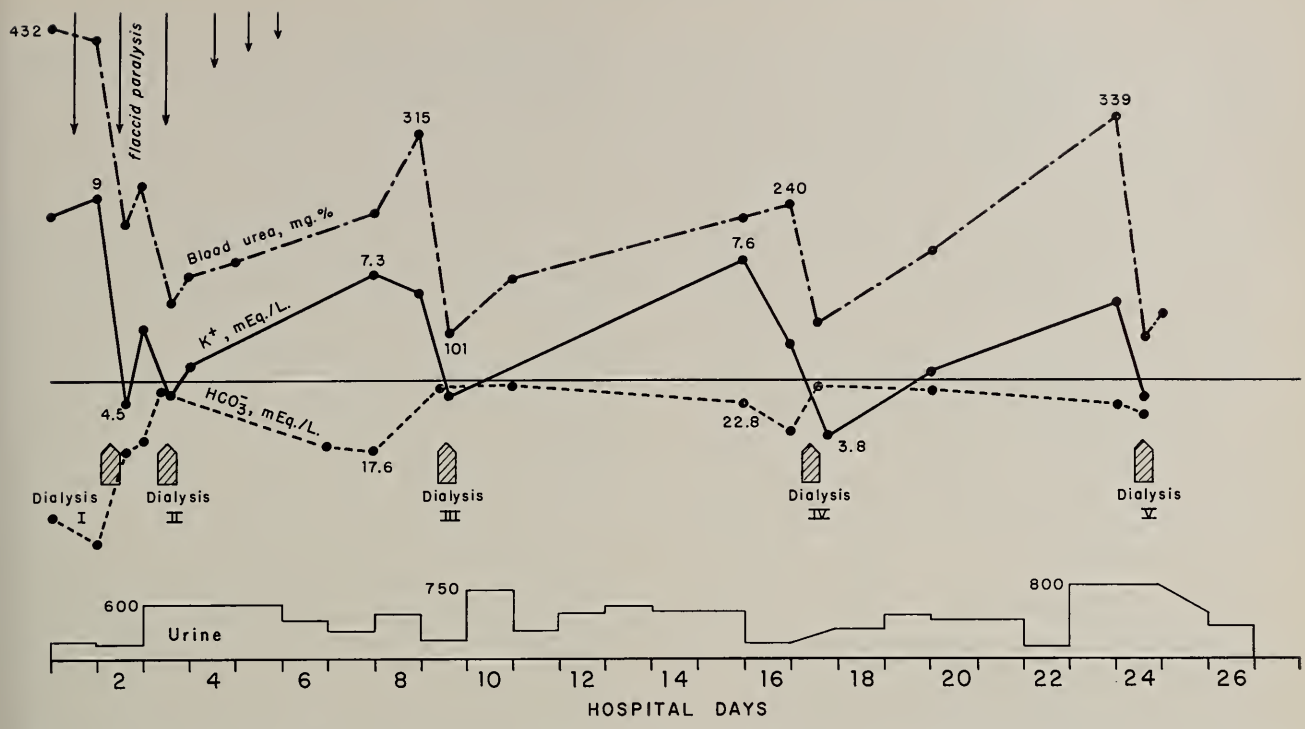


Fig. 2. A boy, aged fifteen, in a chronic renal failure developed severe uremia, metabolic acidosis and hyperpotassemia, and presented a neuromuscular syndrome. Repeated dialysis re-established his electrolyte balance, but the clinical improvement of neuromuscular syndrome lagged for days.

We treated this patient with the artificial kidney on two consecutive days, both for correction of the electrolyte concentrations and for withdrawal of body fluids by ultrafiltration. Simultaneously the anemia was corrected by the administration of whole blood, which can be done during ultrafiltration without the risk of overloading the circulation. The serum potassium concentration was reduced to 4:5 mEq. per liter. Two days later definite improvement in respiration and muscular strength was recorded.

After a third dialysis a renal biopsy was performed; chronic membranous glomerulopathy, severe fibrosis and destruction of the majority of the glomeruli, and tubular damage were found. His general condition could be well maintained by repeated dialyses with ultrafiltration. He was ambulatory, cheerful, and had a good appetite, but his renal disease did not improve nor did his urinary output increase to more than 500 ml. per twenty-four hours. He died at home one month after the fifth and last dialysis.

Comment.—This patient also presented the neuromuscular syndrome. The most prominent chemical abnormalities were uremia, acidosis, and potassium intoxication. Repeated dialyses and ultrafiltration re-established his chemical, water, and electrolyte balance, but the improvement of clinical manifestations of the neuromuscular syndrome lagged behind two days.

Case 3. (Fig. 3).—A little girl of twenty-five months was admitted to the Cleveland Clinic Hospital with salicylate intoxication. Four days prior to admission she fell down five steps, striking the right side of her forehead. She did not lose consciousness and no vomiting occurred; no bleeding from the ears or nose was noticed after the fall. Two days later a mild convulsion occurred. She was given an unknown amount of aspirin and later more aspirin, and became progressively sicker.

On admission, the patient was comatose, responded with motion to painful stimuli, and had severe Kussmaul's respiration. Respiratory muscles certainly were not paralyzed. The serum HCO_3-concentration was 5.4 mEq. per liter. The serum electrolyte concentrations were approximately normal. The blood sugar concentration was 197 mg. per 100 ml., blood urea 36 mg., and creatinine 2.2 mg. per 100 ml. The blood salicylate concentration was 35 mg. per 100 ml. Because it seemed that the child might die at any moment, dialysis was instituted promptly. There was immediate improvement of the Kussmaul's respiration and temporary improvement of her general condition. In spite of correction of the severe acidosis and removal of salicylate by the artificial kidney, she went into a deeper coma on the following day. Episodes of apnea and cyanosis necessitated assistance of respirations by positive pressure apparatus and later a tracheotomy.

Since the reason for the coma was not understood, pneumoencephalography and extensive neurologic and neurosurgical investigations were done. No space-occupying lesion was found. The cerebrospinal fluid contained 58 mg. of protein per 100 ml., 102 mEq. of

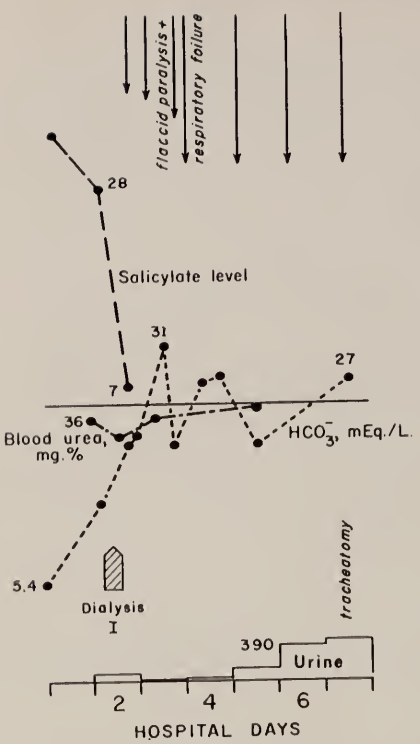


Fig. 3. A litle girl of twenty-five months with a salicylate intoxication developed severe acidosis accompanied by a neuromuscular syndrome. Despite a removal of salicylate and a correction of electrolytes by a dialysis, her condition progressed to an irreversible necrosis.

chloride per liter, and 600 red blood cells and 255 white blood cells per cubic millimeter; on culture it was found to be sterile. There was flaccid paralysis of the muscles of the body and of the extremities with respiratory failure, but her facial muscles and expression suggested that the upper part of the brain was intact. Laboratory studies at this time disclosed: pH of the blood 7.36, blood sugar concentration 75 mg. per 100 ml., and electrolytes, grossly normal. The serum potassium values varied between 3.1 and 5.4 mEq. per liter during these days.

The patient died fifteen days after admission because it was impossible to maintain sufficient pulmonary ventilation. The coroner's office reported: (1) salicylate intoxication; and (2) symmetric areas of subacute neurosis of the medulla and of the upper cervical spinal cord, notably at C1 and C2, and marked cerebral edema.

Comment.—In this case, a probably insignificant fall on the head led the original diagnosis astray. Serum potassium concentrations were within normal limits. The neuromuscular syndrome with flaccid paralysis followed severe acidosis caused by salicylate intoxication, while the serum potassium concentration was relatively little disturbed (3.1 mEq. per liter at its lowest). It seems that the initial damage progressed to an irreversible necrosis even after acidosis and the electrolyte disorder had been grossly corrected by dialysis.

Discussion

The neuromuscular syndromes seen in our patients were almost identical. The adult patients were lethargic and tired, but conscious and cooperative. They had diffuse muscular weakness, most often of the proximal muscle groups, as in myopathy. Deep tendon reflexes were absent. Weakness of the muscles of the face, pharynx, respiratory system, and trunk, such as may occur in polyneuritis, was observed.

It appeared that the upper part of the central nervous system was less affected than the lower part. In the child who died, degenerative changes were found in the medulla but not in the cerebral hemispheres.

The occurrence of similar muscular weakness has been reported in patients with potassium intoxication or depletion.[1,2] McArdle[3] believes that an abnormal potassium concentration in the blood serum is not so dangerous as rapid changes thereof. Others[4,5] think that changes in the proportion of intra- and extracellular potassium concentrations are determining factors to the occurrence of symptoms. Merrill[6] has pointed out that the cells can be depleted of potassium ion even when the concentration in the serum is normal or high.

In the patients described in this paper the neuromuscular syndrome did not regress promptly with correction of disturbances of the potassium ion concentration. The lowest serum potassium values were 2.8 and 3.1 mEq. per liter (Cases 1 and 3); the highest was 8.6 mEq. per liter (Case 2). In patients with simple "potassium" paralysis, we commonly find both lower and higher values.[7] Severe acidosis was the common denominator in the syndrome in the three patients described here, although disturbance of the potassium ion concentration may have played an intermediate role. The chemical disturbances had different causes: uremia, diabetic coma, and salicylate intoxication. A similar neuromuscular syndrome was seen in a fourth patient on the basis of diabetic acidosis. A fifth patient presented the same picture on the basis of infection and renal failure with acidosis. Since adequate treatment of the acidosis did not immediately reverse the symptoms, we believe that cellular damage was done which at best required

time for repair and in one instance (Case 2) was beyond repair. In a patient with severe diabetic acidosis, described elsewhere[8] (serum HCO_3 concentration 5 mEq. per liter), a week elapsed before coma and residual mental symptoms subsided. The neuromuscular syndrome may be overshadowed by the mental disturbance.

Similar clinical conditions may have been classified as diabetic neuritis or polyneuritis,[9] and indeed some neurotic symptoms were present, especially in case 1. As a matter of fact, Ozker, Richards, and Schumacher[10] described this patient, together with another one, under the diagnosis acute polyneuritis following severe diabetic acidosis. Mostly there were generalized muscular weakness, predominantly affecting the proximal muscle groups, and facial paralysis; but there were no disturbances of the sensory nerves except perhaps tingling of the finger tips in the recovery phase. Before the advent of the artificial kidney, patients in extreme uremia and acidosis may have shown the syndrome shortly before death, but if so it remained unnoticed or little attention was given to it.

The artificial kidney makes it possible to equilibrate rapidly body fluids and extracellular electrolytes to any desired level and to remove by dialysis nonprotein-bound toxic substances of such molecular size that they can pass through the dialyzing membrane.[11] Dialysis restores acid-base balance[12] not only by adding $NaHCO_3$ but also by eliminating the acids responsible for the acidosis.

If it is true that severe acidosis may lead to serious neurocellular and electrolyte disturbances, and sometimes to irreversible damage, it seems imperative to treat acidosis as vigorously as possible[8,13-15] and not to postpone dialysis until the damage is done.

Conclusion

It appears that there are risks involved when a patient is left for prolonged periods in a state of profound acidosis and electrolyte disturbance. Our aim should therefore be to correct these conditions. Dialysis eliminates the accumulated acids, whereas the administration of alkali only corrects the pH but leaves the organic acids in the organism.

Summary

A neuromuscular syndrome characterized by paralysis, mostly of proximal muscles, but sometimes including respiratory muscles, is described in three patients. The common denominator in the patient's chemical imbalance was severe acidosis, although elevated and subnormal serum potassium concentrations also occurred. The reasons for the acidosis and electrolyte disturbances were diabetic acidosis, uremia, and salicylate poisoning. The neuromuscular syndrome may become manifest while various clinical disturbances are being corrected, and neurocellular changes may proceed to an irreversible state after correction of the original condition. Awareness of the fact that the neuromuscular syndrome may be due to metabolic-chemical disturbances may obviate extensive neurosurgical diagnostic procedures, and lead to prompt correction of its cause by hemodialysis and ultrafiltration.

References

1. Goulon, M.; Rapin, M., and Tournilhac, M.: Paralysies avec dyskaliemie. *In* Encyclopedie medico-chirurgicale systeme nerveux. 17109 A10, pp. 1-12. Paris: Encyclopedie medico-chirurgicale, 1959.
2. Mollaret, P.; Goulon, M., and Tournilhac, M.: Contribution â l'étude des paralysies avec hyperkaliémie. I. Role de l'insuffisance cortico-surrénalienne (Study of paralysis with hyperkaliemia. I. The role of adrenal cortex insufficiency). Rev. neurol. 98:341, 1958.
3. McArdle, B.: Familial periodic paralysis. Brit. M. Bull., 12:226, 1956.
4. Hodgkin, A. L., and Keynes, R. D.: Active transport of cations in giant axons from Sepia and Loligo. J. Physiol., 128:28, 1955.
5. Hodgkin, A. L., and Keynes, R. D.: The potassium permeability of a giant nerve fibre. J. Physiol., 128:61, 1955.
6. Merrill, J. P.: Electrolyte changes in renal failure. Metabolism, 5:419, 1956.
7. Kolff, W. J.: Serum potassium in uremia; report of sixteen cases, some with paralysis. J. Lab. & Clin. Med., 36:719, 1950.
8. Aoyama, S., and Kolff, W. J.: Severe diabetic acidosis treated with the artificial kidney; report of a case complicated with acute renal failure. J.A.M.A., 166:9, 1958.
9. Merritt, H. H.: A textbook of Neurology, Ed. 2. p. 591, 710 pp. Philadelphia: Lea & Febiger, 1959.
10. Ozker, R. R.; Richards, N. G., and Schumacher, O. P.: Acute polyneuritis following severe diabetic acidosis. Ohio State M. J., 55:1521, 1959.
11. Kolff, W. J.: Acute renal failure: causes and treatment. M. Clin. North America, 39:1041, 1955.
12. Segar, W. E., and Holliday, M. A.: Physiologic abnormalities of salicylate intoxication. New England J. Med., 259:1191, 1958.
13. Kelemen, W. A., and Kolff, W. J.: The clinical application of the artificial kidney; an evaluation of the management of acute renal failure with dialysis. AMA Arch. Int. Med., 102:871, 1958.
14. Schreiner, G. E.: The role of hemodialysis (artificial kidney) in acute poisoning. AMA Arch. Int. Med., 102:896, 1958.
15. Schwartz, W. B.; Hall, P. W., III; Hays, R. M., and Relman, A. S.: On the mechanism of acidosis in chronic renal disease. J. Clin. Investigation, 38:39, 1959.

Dispensing Physicians and Clinic Pharmacies

A Challenge to Our Professions

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The following presentation by Mr. Moen does not necessarily represent the opinions of the Minnesota State Medical Association.

IN MINNESOTA, "inter-professional relations" is far more than a term vaguely denoting well-intentioned impulses but having little practical meaning. Here, the term describes a dynamic, productive inter-action which has been beneficial to all of the professions, agencies and institutions in the health field, and above all, to the citizens of the state.

In any community, medicine, public health, health education, dentistry, pharmacy, hospital administration—all combine to produce the overall pattern of health service. In Minnesota, these groups have worked together toward common goals, while at the same time clearly recognizing that each has a distinct and well-defined role in the total scheme of health services. Surely, this is one of the reasons that the people of this state enjoy what is perhaps the highest standard of public health in the nation.

The value of inter-professional relations has been well demonstrated by the long-standing alliance between Minnesota medicine and pharmacy. As an example, the two professions have for years been united in their opposition to promiscuous self-diagnosis and self-medication. The medical profession has repeatedly joined pharmacy in meeting attacks in the legislature and the courts which would have destroyed our pharmacy laws and legalized the unregulated sale of drugs and medicines in unlicensed outlets of all types. Organized pharmacy sponsored and supported the Durham-Humphrey Act which removed thousands of drugs from the "over-the-counter" category and restricted

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them to sale by prescription only. The Minnesota Board of Pharmacy several years ago enacted regulations prohibiting the self-service sale of so-called "patent" drugs and medicines in Minnesota's drug stores. The Minnesota State Pharmaceutical Association has consistently carried on programs of education and public information warning of the dangers of self-dosing with non-prescription drugs and urging the public to seek early and thorough diagnosis and treatment.

Historically, Minnesota pharmacy has allied itself with medicine in the fight to preserve our traditional system of voluntary health care. At the present time, organized pharmacy is supporting by every means possible, the medical profession's opposition to the Forand bill and similar legislation.

At this time, the threats to our traditional pattern of voluntary health care and the freedom of the health professions are more numerous and graver than ever before. Now, more than ever, it seems essential that medicine and pharmacy, and, indeed, all of the health professions present a united front.

It would, therefore, be regrettable if a situation developed which might in any way weaken the bonds of loyalty and understanding that have linked medicine and pharmacy. Pharmacists and many physicians have recently felt concern over developments which could conceivably lead to such a situation.

I am referring to the dispensing of drugs by physicians and the establishment of pharmacies within medical clinics. The answer to whether or not these practices are desirable, must, of course, be decided by the medical profession.

As a spokesman for pharmacy, I merely wish to raise certain questions which I believe physicians will want to consider in arriving at the answer.

The physicians engaging in these enterprises give various reasons for doing so. One of the most common is the expressed desire to give their patients drugs at lower cost.

This explanation is presumably based on the assumption that (1) the price of drugs, as dispensed by the community pharmacy, is excessively high, and (2) the dispensing physician or clinic pharmacy can provide service and drugs of the same quality as the community pharmacist at a lower price.

The question of whether prescription prices are too high is a deeply involved and controversial one. However, here are some interesting figures which were recently published in the *AMA News:*

> "The nation's most extensive prescription price survey shows that more than 60 per cent of the prescriptions filled in twenty-three different sections of the country during a two-month period in 1959, were priced at $3.00 or less; more than one-third were priced at $2.00 or less; 8.6 per cent at more than $6.00 and 1.7 per cent at more than $10.00."

These figures and all of the other authoritative information available indicate that the percentage of prescriptions costing more than $3.00 is very small.

Not long ago, I had the pleasure of visiting with Dr. Austin Smith, president of the Pharmaceutical Manufacturers Association. Dr. Smith has been the chief spokesman for the drug industry at the Kefauver investigation of prescription prices.

Those who complain about drug prices, he said, can be divided into two groups: Those who don't want to pay and those who can't pay.

The first group, he went on, is made up of those individuals who object to paying for any type of health service—doctor bills and hospital bills, as well as drug bills. Even if it were possible to make a sharp reduction in drug prices, this group would continue to complain, he said.

The second group is made up of those individuals who are simply unable to pay for prescriptions or other medical services at any price—the medically indigent. The reduction of drug prices by half or three-quarters would do little or nothing to alleviate their plight. The solution to this problem, said Dr. Smith, is in the final analysis, a socio-economic problem which should appropriately be solved through the cooperative efforts of the health professions and the public welfare agencies.

Even if we were to assume that the dispensing physician does sell the same prescription drug for less than the pharmacist, can he appease the chronic complainer or help the person who simply cannot pay for drugs?

Over and above the cost of manufacturing and distributing a drug, there are two variable items which contribute to the price—manufacturer's mark-up and the pharmacist's retail mark-up.

Again, a remark made by Dr. Smith is very much to the point. If all the manufacturers' profits from prescription prices were wiped out, he observed, the problems presented by the low-income consumer and the chronically ill would remain. The saving to the consumer that would result

would barely be enough to pay for his daily newspaper.

It would, therefore, follow that even if the dispensing physician or the physician operating a pharmacy within a clinic were to sell drugs at cost, he would be doing little to help those who are actually in need of help.

What about the pharmacist's retail mark-up?

One answer to this question appeared in an article on prescription prices published in *Life* magazine. The article was decidedly unfriendly to the drug industry, it should be pointed out, and could in no way be interpreted as biased in favor of the pharmacist. Nevertheless, *Life* acknowledged that the average retail mark-up on prescriptions was scarcely adequate to meet the pharmacist's overhead. Further, the nationwide survey conducted each year by Eli Lilly Company shows that the pharmacist's profit from drug sales averages 5.7 per cent. Obviously, this represents a very small return on the pharmacist's investment.

In Minnesota, at least, even these figures seem over-generous. Years of daily contact with pharmacists throughout the state have convinced me that most prescription departments operate on a perilously narrow margin. In fact, if pharmacists were to charge against the prescription department all of the overhead expenses actually attributable to it, most of them would find that they are losing money in this vitally important section of the drug store.

Despite the widespread belief that prescription sales produce the major share of the pharmacist's profit, this department is only rarely self-supporting.

Pharmacists are frequently criticized for stocking a broad range of non-drug items. However, the revenue produced by this extraneous merchandise often helps support the prescription department. Without this form of "subsidization," it would be necessary to charge higher prices for drugs to maintain prescription service.

With these facts in mind, is it realistic to assume that the dispensing physician or the clinic pharmacy can provide the same quality of service, and more important, the same quality of drugs and medicines at a lower cost than the community pharmacist? Will they, like the community pharmacy, make available the great number and variety of pharmaceuticals which enable the physician to select from thousands of individual preparations the precise medication indicated?

It is sometimes argued that dispensing by physicians or the presence of a pharmacy in a clinic offers patients greater convenience in having prescriptions filled.

It is difficult to conceive a system that offers greater convenience to the public than the pattern of prescription service that now exists. There is a pharmacy within easy reach of virtually every individual in the state. Pharmacists in every community offer prescription service twenty-four hours a day—early in the morning until late at night, Saturdays, Sundays and holidays. Many pharmacists offer free delivery service and all are ready to respond to an emergency call at any hour.

For various reasons, many dispensing physicians and clinic pharmacists tend to favor lesser known drugs made by small, local manufacturers. Much has been said recently about the use of so-called generic equivalents in place of brand name preparations made by well-known, reputable manufacturers.

Those who advocate the use of generic equivalents argue that their use will reduce the price of prescriptions. This could conceivably lead to a system where the physician would be deprived of the right to specify the precise medication he wants his patient to have. In writing his prescription, the physician would be restricted to using a general descriptive term, without indicating the brand name or manufacturer.

Under our present system, the manufacturer stakes his reputation and future success on every unit of medication he markets. This is an assurance of quality, purity and efficacy, not to mention the fact that the well-established manufacturer has the extensive resources and technical equipment required to exercise rigid control over the drugs he produces.

The majority of patients seeking treatment want the most reliable and efficacious medication available, regardless of variations in cost. Physicians will be the first to say that their patients do not want cut-rate health. Physicians and pharmacists alike have heard requests for a "cheaper substitute" for a certain brand-name drug. But when actually faced with a choice between a brand-name and an unknown preparation, the patient will almost invariably prefer the former.

Perhaps the most serious indictment of the generic-equivalent system is the fact that it would interfere with the patient-physician relationship. Under this system, the responsibility for specifying

the brand the patient is to receive would be relegated to the pharmacist. In other words, the pharmacist, rather than the physician, would decide which brand the patient receives. I am sure that you, as doctors of medicine, are not willing to abdicate *this* responsibility. I am sure you want to exert maximum control over the management of your patients.

It goes without saying that both medicine and pharmacy have their public relations problems. In both cases, one of the major issues is *cost*—the so-called high cost of medical care and the so-called high cost of prescriptions. In fact, we know that these problems are serious enough to make government control a real and immediate threat to both professions.

The establishment of clinic affiliated pharmacies tends to aggravate the problem of medical care costs. Complaints of patients bear this out—patients visiting a dispensing physician or a clinic which houses a pharmacy will generally come to identify one with the other. When it comes to paying for medical care and for a prescription drug, does the patient make a distinction between the two charges? It is more likely that in the mind of the patient the cost of the prescription will be lumped together with the cost of medical care.

Even when the patient makes the mental distinction between the cost of drugs and the cost of medical care, it is quite possible the doctor will still be the main target of any resentful feelings. And I venture to say that many people will adopt this attitude, however, unjustified, without bothering to find out whether the physician has any financial interest in the pharmacy. In fact, the same attitude can be expected to develop even when the pharmacy is wholly owned by the pharmacist in a clinic building. The mere presence of the pharmacy in the clinic will tend to identify it in people's minds as *part* of the clinic.

The operation of a clinic pharmacy would perhaps aggravate the problem by seeming to add a significant sum to what patients regard as their "doctor bill."

Is it not also likely that the dispensing physician and the clinic affiliated pharmacy will tend to restrict the patient's choice? Free choice of physician is, of course, a traditional right, which is to be vigilantly guarded and preserved. Free choice of pharmacist is also a traditional part of our pattern of health service. The dispensing physician and the clinic pharmacy do not, of course, literally deprive the patient of free choice. But in actual practice, it seems highly probable that the availability of drugs in the doctor's office or the clinic pharmacy will create a psychological situation where the patient will almost feel compelled to purchase prescriptions there.

There is another point which should be considered, since we are examining all aspects of this question. Both pharmacists and physicians are aware of the persistent and unpleasant charge that doctors and pharmacists enter into compacts for the purpose of exploiting patients. These vicious, baseless accusations insinuate that physicians prescribe unnecessarily or prescribe excessively expensive drugs to take advantage of a "kick-back" arrangement with the pharmacist.

Such charges impung the integrity of the pharmacist as well as that of the physician. Nevertheless, we must recognize the fact that such suspicions, however groundless, exist in the minds of some of the public. Therefore, it seems altogether possible that the clinic affiliated pharmacy may create a psychological atmosphere which will foster and perpetuate these suspicions. The mere physical proximity of the pharmacy and the clinic could, indeed, arouse suspicions where none existed before. And while completely unfounded, this factor could again serve to aggravate a problem which is already serious.

Over the years, there has been a trend for the physician to disencumber himself of the many tasks which do not require his specialized skill and knowledge. He has shown an increasing desire to delegate responsibility to supporting specialists—x-ray technicians, anesthetists, biologists, pharmaceutical manufacturers and pharmacists. In doing so, he has been able to serve more patients more effectively, thus helping to meet the unprecedented demand for medical care, despite the shortage of physicians.

In these remarks the following questions have been presented: Does the dispensing physician or clinic-affiliated pharmacy answer a need within our established scheme of health services? Will they offer the same quality of drugs and medications to patients at a lower price? Do they answer a need for more convenient availability of drugs?

Among the majority of Minnesota's doctors of medicine, I know the answers to these questions will be determined by what is best for the medical profession generally and for the health and welfare of the people of Minnesota.

Medicine and Its Practitioners in Mower County Prior to 1900

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Dr. O. H. Hegge, of Austin, has spoken of the generations, in chronology not kinship, of physicians in Mower County, mentioning some of the earlier men who had survived into his day, and including men who now are in practice. He places Dr. Orlenzer Allen and Dr. John N. Wheat, of Austin, and their immediate contemporaries, as well as Dr. W. F. Cobb, of Lyle, Dr. G. W. Gray, of Brownsdale, and Dr. W. H. McKenna, Dr. W. L. Hollister, Dr. O. W. Gibson, all of Austin, in the first generation. Dr. Hegge and his brother Dr. C. A. Hegge, who came to Austin together in 1893, Dr. F. E. Daigneau, Dr. A. W. Allen, and others in their approximate age group, were of the second generation, and those who entered practice after the turn of the century, and in later decades, were, and are, of the third and the fourth generations, "as the first 100 years of medicine in Mower County are coming to a close." Each generation of physicians feels superior in resources to the preceding generation, and the physicians of today, middle-aged and younger, not to mention recent graduates, wonder how the "old-timers" got along without the benefits of modern science. In 1911 Dr. Arthur West Allen, son of the first physician in Austin, and himself a "pioneer doctor" (in practice 1885-1940) by present-day standards, wrote as follows:

> The early history of the pioneer physician is naturally a story of feeble resources. His professional limitations were, therefore, necessarily great. To enable us to understand these limitations we must take a retrospective glance at the conditions of medicine sixty years ago. Imagine, if you can, the forlorn condition of the doctor without our present means of physical diagnosis, without the clinical thermometer, the various specula, the rhinoscope, the aspirator, and many other similar instruments; without the aid of hematology, of anaesthetics, of antisepsis, of the modern microscope, without our laboratories and experiments, our chemistry, our bacteriology, our roentgen rays, our experimental pharmacology, and our antitoxins—without anything except his eyes, his ears, his fingers, his native vigor and resourcefulness; then we can appreciate the professional limitation of our fathers, appreciate no less the triumphal march of medicine during a single lifetime. It requires no prophet's power to foretell the fact that the science of medicine stands at the hour upon the threshold of an era which will belittle all the past. In this most wonderful era of the world's history, the magic age, the science of medicine is rapidly being elevated into the position of one of the bulwarks of society and one of the mainstays of civilization.

To Dr. Allen's viewpoint his successors of today may add their own wonder, seventy-two years since he began practice, "How did his generation do without antibiotic drugs such as penicillin and the many others that have been developed in recent years, or blood transfusions, or glandular hormones such as cortisone? Physicians still feel that they are upon the "threshold of an era" in scientific medical progress, and can but wonder what the historian of 2001 will think of them and their "meager facilities."

While his professional life was rugged enough, the early physician's family life was certainly no less filled with hardship than that of his contemporaries in other occupations. Diphtheria was the dread disease of those times, and parents then must have feared its fatal effects, much as parents now fear the crippling disease, poliomyelitis. In the Hollister family scrapbook there is a newspaper clipping, undated but probably about 1878, which describes the tragic deaths from diphtheria of two little sons of Dr. O. W. Gibson, and two children of his next door neighbor H. A. Fairbanks. Each family had three children, each lost two of them. When Dr. Hollister died in 1921, his obituary, like so many of that day, contained the terse and unrevealing sentence, "Two children died in their infancy." The family scrapbook, however, contains newspaper accounts of the death of one son, about twelve years old, in 1878 from diphtheria, and of another, aged twelve years, in 1882, from lockjaw following a hunting accident. From such experiences in their own homes, it is understandable that the physicians developed the sympathetic understanding of and concern for their patients for which they are remembered.

The first physician in Austin undoubtedly lived in a log cabin. In the *History of Mower County* published in 1911 is found a delightful description of the cabin of "Judge (In Embyro) A. and Wife." This no doubt was the first home of Ormanzo Allen, twin brother of Dr. Orlenzer Allen, the pair being the first professional men to settle here (1856), when "about a dozen families were scattered here and there in the 'openings.'" The cabin, typical of all the earliest homes, better than some, had one window, which shoved sidewise to open, the door was hung on wooden hinges, and the ceiling barely cleared the heads of the occupants. Stools were made of boxes, and a bed, of prairie grass, was on the floor. This shelter was in sharp contrast to the handsome residence of Judge Ormanzo Allen that is pictured in an illustrated historical atlas of 1874.

As mentioned earlier, Dr. John N. Wheat came to Austin only a few months later than Dr. Orlenzer Allen, "yet early enough so that Mrs. Wheat gave birth to the first female child, Carrie M. Wheat, born in the new settlement." The first male child (Austin, son of George Bemis) had been born a year earlier, B. D. (before doctors). Dr. Wheat must have hoped to give his daughter every advantage, since he is credited with having purchased the first piano owned in the city. At an early settlers' reunion, in 1876, Dr. Wheat described one of his experiences in the winter of 1866, "when the snow was four feet deep on the level, and drifted badly in places, and at times so crusted over with ice that a man could walk upon it without much difficulty, only breaking through occasionally." Over or through this depth of snow he was called professionally to attend a patient in the Vanderwalker neighborhood, a settlement some six miles northwest of Austin. Here he found twenty-three persons—men, women and children—inhabiting one log house, its single room 14 ft. by 16 ft., without floor or windows, unless the two small panes of glass framed in the logs might be called windows; with stools for chairs; prairie grass for beds, and without bread or vegetables for food. Here were three persons dangerously sick, and in order to give them proper attention he found it necessary to make the journey every other day on foot in great discouragement, often breaking through the snow crust and sinking to the waist. Experiences of this type, altering name, date and place, were known to every pioneer physician of the early era.

Public Health and Public Welfare

The Minnesota Code of 1851 authorized justices of the peace, village trustees and city councils to exercise the functions of relief and maintenance, always by local agents, to those among the sick poor who did not receive due care from relatives.

Soon were added the duties of abating nuisances injurious to health and comfort, and next of imposing quarantine against smallpox and other contagious diseases. The General Statutes of 1866 made town supervisors local boards of health. In 1872, owing largely to the initiative of Dr. Charles N. Hewitt of Red Wing, the Minnesota State Legislature officially recognized health as a matter of public concern and established the state board of health, to act for the prevention of disease and the promotion of general health. The powers of the state board of health were comprehensive but merely advisory, extending into counties and townships. In 1873, the authority of the state board was strengthened to the extent of requiring each township to elect a town board of health of not less than three members, one of whom was to be a physician.

In accordance with the state law passed in 1869, the official records of births and deaths began. This ruling proved extremely difficult to enforce, even after fines were imposed on those who ignored it. As late as the nineties, the state board of health was continuing its efforts to educate the public in the importance of observing the law.

In the pioneer years living conditions were necessarily crude, and measures for sanitation were primitive or, in some localities, lacking. The early physicians met the problems of public nuisance, endemic disease and epidemic disease as well as they could, but their knowledge and experience were inadequate, and the laity were largely uninformed or indifferent, many of them ignorant and superstitious.

Armstrong commented, in some unpublished work on early conditions of medical practice in Mower County, that in this county there were fewer medical impostors than in counties to the east, fewer crimes, that there was lower incidence of contagious diseases in general and that, notably, Asiatic cholera was not known here. He inferred that there was less, or later, opposition in Mower County than elsewhere in southeastern Minnesota to quackery, crime, and inebriation, and less awareness of the danger of contagious disease. The public was slow to recognize the necessity for local boards of health. Local and county medical socities (q.v.) were not organized until a relatively late date.

The Poor, the County Coroner, and Boards of Health

In some counties *the poor* were attended by local physicians who sent in their bills, at the end of the year, to the county commissioners. The first such record in Mower County is of bills presented in 1859 by Dr. Orlenzer Allen and Dr. H. L. Coon for attendance on the sick poor. Mower County had not long been settled when it became necessary to establish a county poor farm, which was placed at Le Roy from 1868 to 1876; in the latter year it was established in Lansing Township, near Austin.

In Mower County, beginning in the eighteen seventies, two county physicians usually were appointed by the year, the salaries running from about $60 or less to $150 annually (the physicians furnishing medicines and their own transportation). Occasionally, other unofficial physicians, also presented bills for service to the poor. The county was divided, primarily because of topography, and secondarily by political tension (as mentioned earlier) into the West Half and the East Half, in point of service by the county physicians. In the early years Drs. J. N. Wheat, R. A. Barnes, W. L. Hollister, C. B. Thrall and G. M. Allsdurff were among those who served as county physicians.

Although some of the neighboring counties revised their rulings for the care of the poor, Mower County, in the eighties, continued to elect regular county physicians as it had done in previous years. Drs. L. D. Jackson, O. W. Gibson, G. W. Gray, W. A. Frazer, A. MacDonald and C. H. Johnson were some of those who served as

county physicians in this period and later. In fact, over a long period, most of the practicing physicians of the county served at one time or another in this capacity. A few of those who held the office in the nineties were Drs. C. A. Hegge and O. H. Hegge, Fanny G. K. Fiester and H. F. Peirson. In the latter period three or four physicians were elected each year, at the nominal salaries mentioned heretofore, the amount annually depending on the size of the district served.

The *county coroner,* in all counties, was one of the first officers needed. In many counties, for some years, the coroner was a layman. In Mower County the coroner was elected each year, and a physician regularly served in that office. Dr. Orlenzer Allen was coroner in Mower County in 1856, the first physician to hold the office, and in 1859 and later. Payment of the coroner depended on the amount of service he was called on to perform. Many different physicians served from time to time, as will be mentioned in the respective biographical sketches. Dr. R. A. Barnes, in the sixties and seventies, was coroner for many years. Much later, Dr. A. E. Henslin, who came to Le Roy in 1895, was coroner for twenty years.

Some time during the eighties, Austin formed a *board of health,* as did Grand Meadow, and subsequently other villages followed suit. The physician who was appointed city or village health officer was responsible for sanitation and for quarantine, but possessed little real power or authority. When members of the board served as physicians, they usually drew small salaries. In general, the early boards of health in the county ordered the citizens to clean up alleys, streets and premises. They analyzed well water, and reminded the population of the rules concerning contagious diseases. Some of the residents were obstructive, and some were cooperative, to the extent of sending to the local newspapers pungent comments on the delinquencies of others in such matters as wells, alleys, cellars and outbuildings. The boards reminded the citizens of the necessity also of registering births and deaths.

Diseases and Epidemics

Definite information about epidemics and disease in Mower County, in the sixties, particularly, is relatively scarce.

Diphtheria.—Mention has been noted of severe outbreaks of diphtheria in 1864, 1866, 1867, 1870 and later. There were sporadic cases of the disease almost every year. In Le Roy, in 1864, the newly arrived Dr. G. M. Allsdurff gave valiant service during an epidemic. In 1866 Dr. J. L. Martin, of Frankford, combated a severe outbreak of diphtheria in the community. In 1870 Dr. E. J. Kingsbury, who had just then returned to the county, to Le Roy, after ten years in Fillmore County, gave outstanding service in another epidemic. Diphtheria again was epidemic in the locality of Le Roy and elsewhere in the winter of 1878, and in the first three months of 1879 many persons were ill from it. In that period there were several deaths among the children of physicians.

During the eighties diphtheria prevailed to a much greater extent than in previous years. In fact, judging by newspaper references, there was only one year in that decade in which the county seems to have been free from the disease. It was most prevalent during the winter months, owing perhaps to the closer association of persons indoors during the colder weather than in the more open seasons, and to the greater opportunities for contagion among children during sessions of school. The disease was spread throughout the county, and the schools were closed because of it. Its virulence is proved by the numbers of deaths recorded. As if to make up for the high death rate, among children, one observer noted, it was usual to find a correspondingly high birth rate, both among families in the lower financial brackets and among families who could maintain a higher standard of living.

In almost every year during the nineties, diphtheria was present somewhere in Mower County and the adjoining counties. In the last half of the decade schools commonly were closed part of the time, and public meetings were barred. At that period antitoxin was just beginning to come into general use.

Other Diseases.—In the winter of 1868-1869 and into the early spring, measles in an extremely severe form afflicted neighboring Freeborn County and to some extent Mower County. There were few fatalities, but in the affected communities hardly a family escaped the disease.

Measles, chickenpox, "throat trouble," fevers, ague, meningitis and erysipelas were each represented prior to 1900. Whether the following proves the general healthfulness of the region or whether it is an indication of the opposite, is doubtful: At any rate, one of the respectable physicians of Austin included on his professional card, in 1872, the information that he gave special attention to embalming, deodorizing and disinfecting dead bodies.

Whooping cough, particularly in 1886, was troublesome. From time to time cases of typhoid fever appeared, and "typhoid malaria," but these occurred only in the country or in the small villages, and very few persons were affected.

During the first few years of the eighteen seventies scarlet fever often was present. In July, 1870, there were reports of its appearance around Austin. In February, 1871, many cases were reported in the city, and at about the same time the disease appeared near-by in Freeborn County. Outbreaks continued into June 1872. In January, 1873, the disease again was reported in Austin, and in April in Freeborn County. It prevailed again to a considerable extent in 1880, 1881, 1884 and 1885. In 1886 "Austin was busy using sulphur." In 1889 there again were a few cases.

The only mention found of smallpox in the newspapers in the eighteen seventies concerned two families in Freeborn County in 1872. If these were the only cases locally, Mower and Freeborn Counties were fortunate, for the disease was prevalent in other parts of the state. Only one case was reported in Mower County in 1882.

As for malaria, the following statement was published in 1883: "Our situation is necessarily healthful and free from malaria. Our elevation is an effectual and perpetual injunction against the inroads of fevers of any kind."

Although the number of sufferers from pulmonary tuberculosis was not greater in Mower County than in any other section of the state, the presence of these invalids was a worry. The early advertisements of the colonizing companies, that the salubrious climate of Minnesota was a cure for "consumption," had long since been discontinued. Many types of medical treatment were advocated. Among the newer ones which came into vogue was "medicated inhalation." This was used for all pulmonary troubles and especially for tuberculosis. A physician who used the treatment was regarded as progressive. The popularity of the method became evident when the local tinsmiths began inventing and trying to patent their own apparatus for the purpose. In 1887, some publicity was given to the fact that Dr. W. L. Hollister of Austin had purchased an apparatus used for Bergeon's method of treating consumption by "gaseous enemata."

In the early months of 1890 there was a severe epidemic of influenza or "la grippe" throughout the region. Scarcely a village in the counties of Mower, Freeborn, Dodge and Steele escaped. At many schools only half of the pupils were present, and at one school in Austin only ten out of an enrollment of seventy were not affected. By February, 1890, the disease had subsided in Austin, and in Albert Lea, so that most of the seriously ill patients were in the small towns or in the country. Thereafter the disease recurred almost every winter in the various communities, but it was milder, of shorter duration, and affected relatively few persons.

Occasionally in the last decade of the century, schools were closed for short periods because of scarlet fever. Now and then some locality reported mumps, measles or whooping cough.

Gradually but steadily, improvement was brought about in measures for public health and public welfare. It has been noted that physicians who served as mayor of Austin were influential in this advance in the city. Dr. O. W. Gibson was a progressive mayor for three consecutive terms beginning in 1888. Dr. C. H. Johnson served six terms as mayor, and to him are credited the institution of various improvements, some of which promoted public health as such and all of them, public welfare: a sewer system, electric lighting, a viaduct, new fire-fighting apparatus, and extension of public utilities.

Organization of Medicine

Nothing contributed more to public welfare in Minnesota than the organization of medical practice. Organization resulted largely from awareness on the part of the accredited physicians of the menace of quackery, of the need for improved medical education, and the importance of greater solidarity among members of the profession. The solution of the triple problem was medical legislation and the formation of medical societies. It is not necessary to review in detail the medical legislation in the state. The well-meant but abortive law of 1869 (repealed the next year) instead of shutting out the quacks and itinerants, inadvertently, through a technicality, opened the field to them. This effort was followed by the effective laws of 1883 and 1887, and those enacted later in the century as new problems arose. The acts of 1883 and 1887 protected physicians and the public from quacks and incompetents, led to improvement in professional qualifications, and aided in closer association of physicians.

The established custom of intercounty practice throughout the state, wherever practicable, was a factor in fostering mutual respect and esteem among physicians and in promoting the formation of medical groups. Most of the well-known physicians of Mower County were called professionally into the adjoining counties, and the physicians of those counties were summoned into Mower County. For example, Dr. W. F. Cobb, in Mona, Iowa, from 1874 to 1895, was well-known and valued not only in two or more counties of Iowa, but also in Mower County, long before he established his residence in Lyle in 1895. Dr. C. A. Hegge and Dr. O. H. Hegge, who began practice in Austin in 1893, soon were answering calls in four counties in Minnesota and in three counties in Iowa.

An early sign of the changing attitude of physicians toward the art, science and ethics of medicine was the attempt to found county medical societies, a procedure that long had been urged by the American Medical Association and by the state medical societies. In Minnesota the work began in the eighteen fifties and sixties. By 1872 there were in Minnesota six county medical societies, all of which were affiliated with the Minnesota State Medical Society.

In addition to the few groups which then were component parts of the state medical society, there was organized in Minnesota in 1867 the Minnesota State Homeopathic Institute, and subsequently there were various local homeopathic medical societies (city, county, and district) some of which had interest for physicians of Mower County. In 1869 the Minnesota State Eclectic Medical Society was founded, with various members from southern Minnesota. In 1871 the society met in Austin, at the office of Dr. C. H. Blecken, at which time Dr. P. C. Berry, of Austin, was admitted to membership.

Although the physicians of Mower County did not organize a county medical

society as a component part of the state medical society until after 1900, they were interested in medical organization at a much earlier date. In February, 1880, a meeting was held at which it was resolved to found a medical society that should include physicians from Mower, Freeborn, Fillmore and Steele Counties. Drs. L. D. Jackson, F. M. Johnson (C. H. Johnson did not come to Austin until 1884), and W. L. Hollister were appointed to correspond with the physicians of the other counties to enlist their interest. The name chosen was "The Southern Minnesota Medical Society." Perhaps this group was a forerunner of the Southern Minnesota Medical Association which was founded in 1892. Although the local society persisted, for a while it was rather loosely organized and did not meet often. There was, as late as 1896, when Dr. H. F. Peirson was president, what later was recalled as "the old Mower County Medical Society"—possibly a survival of the group organized in 1880.

Before 1900 several physicians of Mower County were admitted to membership in the Minnesota State Medical Society. It appears from entries in the *Transactions* of the state society that Dr. J. A. Allen of Austin was the first, in 1870; his name does not appear on the roster after 1874. Three members—Dr. L. D. Jackson, Grand Meadow, and Dr. W. L. Hollister and Dr. J. P. Squires, both of Austin, were admitted in 1880 (a fact significant when considered with the meeting held that year to organize a four-county society). Dr. Emma Backus Fairbanks became a member in 1885; Dr. D. F. O'Connor, Grand Meadow, in 1897; and Dr. W. F. Cobb, Lyle, and Dr. C. A. Hegge and Dr. O. H. Hegge, Austin, in 1898. Dr. W. W. Freeman, Grand Meadow, was admitted in 1900, and Dr. A. W. Allen, Austin, in 1901 or 1902, to be followed by many others after the organization of the Mower County Medical Society.

Various physicians of Mower County became founders or early members of the Southern Minnesota Medical Association, founded in the summer of 1892. At a meeting held in August, 1898, Dr. W. N. Kendrick, of Austin, was elected one of the vice-presidents. Also present from Mower County were Dr. M. J. Hart, Le Roy, and Dr. Albert Plummer, Racine.

The Mower County Medical Society

To discuss the formation of the Mower County Medical Society, which was founded after the turn of the century, goes beyond the nominal contents of this article (events prior to 1900) but since most of the organizers had settled in the county considerably earlier, some of them in the late sixties, the seventies and early eighties, the lists of members are of interest. The following statements, ending with an authoritative account, all are matters of record in one way or another. They are given here without controversial implication and without attempt to explain the apparent discrepancy.

October 3, 1902, has appeared in different accounts as the date on which the Mower County Medical Society was founded. From entries in the *Transactions* of the Minnesota State Medical Association and from an account in the general history of Mower County, of 1911, this date would seem to be correct.

There is evidence in the records of the state society that the county society was not in existence before June 18, 1902. In the report of Dr. R. J. Hill, treasurer of the state society, of that year, published in the volume for 1903 of the *Transactions,* appears the statement that on January 16, 1903, he "received of C. A. Hegge, Secretary of the Mower County Society, $44." In the same volume, Mower County is listed as one of the counties in which new societies had been formed as part of the new program of organization. The American Medical Association recently had been urging the organization of county societies as component parts of

the official state medical associations, as formulated in the new constitution and by-laws of the national association. Beginning in August, 1902, in Minnesota, Dr. W. S. Fullerton, acting for the Minnesota State Medical Association, was the organizer of the auxiliary county and district societies.

The following statement is taken verbatim from the *History of Mower County,* 1911, from a chapter that was edited by Dr. Arthur West Allen, of Austin.

MOWER COUNTY MEDICAL ASSOCIATION

In the preceding paragraphs has been related the story of the early physicians of Mower County. The present-day physicians are nobly following in their predecessors' footsteps. The Mower County Medical Association was organized October 3, 1902. The meeting was called to order by Dr. W. S. Fullerton, state organizer, and Dr. C. A. Hegge, the former being made temporary chairman and the latter temporary secretary. The officers elected were: President, William Hollister; vice president, W. F. Cobb; secretary, C. A. Hegge; treasurer, G. F. Schottler. The physicians present at the organization were: A. W. Allen, O. H. Hegge, C. A. Hegge, William Hollister, W. H. McKenna, F. Kimball Fiester, C. F. Lewis, H. F. Pierson, E. H. Washburn-Rodgers, O. C. Marcklien, George W. Gray, G. J. Schottler, W. W. Freeman, W. F. Cobb and W. A. Frazer. Since then the presidents have been: 1903, William Cobb; 1904, A. E. Henslin; 1905, H. F. Pierson; 1906, G. J. Schottler; 1907, W. A. Frazer; 1908, C. C. Leck; 1909, M. J. Hart; 1910, C. F. Lewis. The society has done much to sustain the ethics of the profession, to promote the sanitation of the county, to protect the health of the community and to guard against charlatanry in all guises and forms. The society is now constituted as follows: President, C. F. Lewis; secretary, Clifford C. Leck, Austin; other members, A. W. Allen, Austin; W. F. Cobb, Lyle; A. N. Collins, Austin; W. A. Frazer, Lyle; G. W. Gray, Brownsdale; M. J. Hart, Le Roy; C. A. Hegge, Austin; O. H. Hegge, Austin; A. E. Henslin, Le Roy; C. H. Johnson, Austin; R. S. Mitchell, Grand Meadow; Homer F. Pierson, Austin; G. M. F. Rogers, Austin; G. J. Schottler, Dexter; E. V. Smith, Adams; P. T. Torkelson, Lyle.

In the *Transactions* of the Minnesota State Medical Association, in the volume dated 1903, appears the following roster of the new Mower County Medical Society:

W. L. Hollister, Austin, *President*
C. A. Hegge, Austin, *Secretary*
W. F. Cobb, Lyle
F. E. Daigneau, Austin
Fanny K. Fiester, Austin
W. A. Frazer, Lyle
W. W. Freeman, Grand Meadow
G. W. Gray, Brownsdale
M. J. Hart, Le Roy
O. H. Hegge, Austin
A. E. Henslin, Le Roy
C. H. Johnson, Austin
H. L. Knight, Adams
C. C. Leck, Austin
C. T. (F.) Lewis, Austin
W. H. McKenna, Austin
O. C. Maercklin, Adams
H. F. Peirson, Austin
E. H. Rodgers, Austin
G. J. Schottler, Dexter

In the report of the Mower County Medical Society in the volume dated 1904, Dr. W. F. Cobb, Lyle, was listed as president, Dr. C. A. Hegge, secretary. Additional names on the roster were those of A. W. Allen, F. W. Davis, W. W. Kendrick, Benedick Melby (Hayfield), C. J. Maercklin, and F. W. Schultz (Waltham).

In 1955 Dr. O. H. Hegge, of Austin, prepared the following important account of the organization of the Mower County Medical Society, quoted exactly, which places the date of founding as April 8, 1904. Dr. Hegge made available to the present writer the charter which was issued by the Minnesota State Medical Asso-

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Errors in initials and in spelling of surnames are given here as they appear in the printed account.

ciation, dated April 8, 1904, and signed by Dr. Thomas McDavitt, Secretary, and Dr. Charles Lyman Greene, President:

Organization of Mower County Medical Society.—March 16th, 1904, Dr. O. H. Hegge had occasion to go to St. Paul, and on the street he met Dr. Thomas McDavitt, secretary of the Minnesota State Medical Ass'n. The doctors were well acquainted, since Dr. Hegge had spent one year in St. Paul as assistant to Dr. Edward Boeckman. Dr. McDavitt and Dr. Hegge arranged to have lunch together at the St. Francis Hotel, and during the lunch hour they talked over the need for organizing a county medical society in Mower County. As secretary of the State Medical Ass'n., Dr. McDavitt was anxious to have a county society in every county where there was a sufficient number of physicians to make this plan feasible. Dr. Hegge went back to Austin determined to try to organize the Mower County Medical Society, if the idea met with sufficient encouragement from the other physicians in Austin and Mower County. After talking the plan over with his brother, Dr. C. A. Hegge, and other physicians in the county a meeting was called on April 8, 1904, to be held in the upstairs parlors of the Fox Hotel, and here the Mower County Medical Society was organized with Dr. O. H. Hegge as temporary chairman. Dr. Willis F. Cobb, an old and respected physician of Mower County, had previously been approached by Dr. O. H. Hegge, and Dr. Cobb had promised to become the first president of the newly organized society. Dr. C. A. Hegge was elected the first secretary and Dr. G. J. Schottler, of Dexter, Minnesota, treasurer. The Mower County Medical Society was thus started April 8, 1904, and Dr. McDavitt was notified of our organization and he consequently sent us the charter issued by the Minnesota State Medical Ass'n., of which the Mower County Medical Society is a component part. The Mower County Medical Society has continued to function for 51 years—monthly meetings are held except in the three warmest summer months.

The unit of medical organization is the *county* society. County Societies make up the State Association, and State Societies the American Medical Association.

At this writing, the Mower County Medical Society has functioned successfully fifty-three years and five months, from the date of the charter.

St. Olaf Hospital, Austin

To the vision and initiative of Dr. O. H. Hegge, of Austin, was due the founding of St. Olaf Hospital, which was opened to the public in the summer of 1896, then a small hospital of twenty-five beds. A little later there followed the organization of the St. Olaf Hospital Training School for Nurses.

The initial investment in the hospital was that of Dr. Hegge, "a small beginning, about $25,000," which soon was increased to more than $50,000 by public subscriptions, at first chiefly those of the Lutheran congregations of Austin and vicinity, later those of many other persons. A few years earlier the Drs. Hegge had a small private hospital of five beds in rented rooms upstairs over the offices of the *Daily Register* of Austin.

In the idea of a community hospital for Austin and the surrounding region Dr. Hegge had the full endorsement of his brother Dr. C. A. Hegge, and in the planning and work, his devoted aid. Fellow Lutherans, and numerous other citizens, gave sympathetic and practical help, and his professional colleagues in the city and the county, their interest and cooperation. Dr. Hegge has said:

"I founded, named, and financed the institution at first, and I also had the hospital incorporated as a Lutheran hospital, with adherence to aged medical practice. No lines were drawn as to color, creed, or nationality. All regular physicians, and their patients, were accepted and treated alike. The same is true today (1957). St. Olaf is essentially a community hospital, an 'open' hospital, where about thirty-five different doctors serve the public and the institution."

When St. Olaf Hospital was opened, Sister Lena Nelson, who had been at the head of the surgical department of the Deaconess Hospital in Minneapolis, was placed in charge. Later she returned to the Deaconess Hospital as director, and was replaced at St. Olaf Hospital by a hospital matron who had served in a similar position in Hillsboro, North Dakota.

Additional data taken from the county history of 1911 elaborate somewhat Dr. Hegge's account: The purpose of St. Olaf Hospital was not for private gain, but for service to the public. Patients were received on the recommendation of any member of the regular medical profession, on the approval of any member of the medical staff, or by consent of the majority of members of the board of trustees. Arrangements were made for admitting charity patients, without regard to religion, race or condition in life. Patients were privileged to summon any physician whom they preferred.

The first official members of the professional staff of the hospital were Dr. O. H. Hegge and Dr. C. A. Hegge. On the first board of directors were The Rev. J. Muller Eggen, of Lyle, President; The Rev. S. O. Rondesvedt, of Grand Meadow, Vice-President; The Rev. E. T. Rogne, of Austin, Secretary and Treasurer; P. K. Everson of Hustad, Iowa, and L. F. Clausen and Dr. O. H. Hegge, of Austin.

St. Olaf Hospital has grown from its modest beginning to a hospital of more than 180 beds (1957) and an approximate value of two million dollars. Four additions to the building have been made since 1900: in 1906, 1915, 1918, and 1955. The hospital serves a wide territory; patients come to it not only from Mower County but from neighboring counties in Minnesota and in Iowa.

At the Close of a Century

In 1856 Mower County had 127 miles of county roads, and no railroad, as compared with the present network of highways and lateral roads and the railway facilities. In 1856 the population of the county was a matter of hundreds; by 1859 it was 3,700; in 1957 (census of 1950) it is 42,277, and probably more. In 1856 Austin was a settlement of thirteen scattered homes and a few businesses. Today it is a thriving city (since 1857, the county seat) of more than 30,000 population, and is distinguished for civic, industrial and professional achievement. Some of the villages of the county developed correspondingly; some, as in all counties, became "ghost towns." In 1856, of the possibly seven physicians in the county, with the limited professional resources of the day, two were in Austin. Today there are in Mower County about thirty-five members of the regular profession, most of them in Austin, who have at their command every advance that has been made in the practice of medicine.

Biographical Sketches

About many of the practitioners of medicine in Mower County prior to 1900, as mentioned earlier in this account, there unfortunately is slight record. Concerning others, known and loved for their skilled and faithful service over many years, more, but not enough, is known. Too often the physician is unsung. All listed here, however, played a part, great or small, in the development of medical practice in the region.

— **Aldenkirk,** a homeopathic physician, a native of Germany, came to Le Roy from Winneshiek County, Iowa, in the spring of 1881, and began the practice of medicine. It is recalled that he had a fairly good office business. After about two years he removed to Postville, Iowa.

Abraham Orlenzer Allen, born in 1850 in Wisconsin, was one of the five children of Dr. Orlenzer Allen, pioneer physician of Austin in 1856, and Esther Almeda Coon Allen. Abraham O. Allen received part of his early schooling in Austin and perhaps his preliminary medical training from his father. In 1884 Dr. A. O. Allen was practicing medicine at Wolsey, Beadle County, Dakota Territory. In the official record of physicians of the Territory it was stated that he was graduated from Rush Medical College, Chicago, on February 16, 1886, and licensed in Dakota Territory, under the new territorial legislation, on March 22, 1886.

Dr. A. O. Allen was licensed in Minnesota under the Affidavit Law of 1887 and again, apparently, in 1889. For a few years he was in practice in Austin with his brother, Dr. A. W. Allen (*q.v.*). In 1893 he was listed as of both Austin, Minnesota, and South Sioux City, Dakota County, Nebraska. In 1902 he was recorded as of both Mountain Lake, Cottonwood County, Minnesota, and Hart, Oceana County, Michigan.

From 1898, for most of the time until his death at his home on October 13, 1913, Dr. Abraham Orlenzer Allen was a resident practitioner at Mountain Lake, Minnesota. In the last mention of his name in a medical directory he was designated "Abram Orrinzer Allen," and the name so appeared in his obituary in the *Journal of the American Medical Association* of November 8, 1913.

Arthur West Allen, a son of Dr. and Mrs. Orlenzer Allen, who came to Austin in April, 1856, was born in Austin in August, 1862, the youngest of the five children in the family. He grew up in the city and there received his early education. In 1885 he was graduated from Rush Medical College, was licensed in Minnesota on June 12 of that year, receiving certificate No. 1070 (R), and at once began the practice of medicine and surgery in Austin, where until his death in 1940 he was an honored citizen and physician. As noted, for a few years his brother, Dr. A. O. Allen, was in practice with him.

Dr. A. W. Allen served his city and county in various capacities. He was coroner for some years, a county physician, one of the earliest members of the Mower County Medical Society and automatically a member of the Minnesota State Medical Association and the American Medical Association. He encouraged the organization of St. Olaf Hospital and was one of the first to use its facilities in his practice. For a time he specialized in ophthalmology. For nine years he was Surgeon-Major of the Second Regiment of the Minnesota National Guard. He was local surgeon of the Chicago, Milwaukee and St. Paul Railway Company, and a member of the American Association of Railway Surgeons. For two years, about 1909-1911, he was president of the Austin Commercial Club. He was a member of various fraternal groups, among them the Masonic Lodge and the Benevolent and Protective Order of Elks, a charter member of the Austin Lodge of the Elks.

Although actively interested in civic enterprise and in politics, Dr. Allen, a Republican, never sought or accepted political office. Always outspoken, but moderate in expression, he energetically promoted the establishment of municipal waterworks at a time when Austin had only a pump at the corner of Main and Mill Streets, and urged the purchase of Sargent Springs (later City Springs), which came about in 1910; the paving of Main Street; and a better sewerage system. It is said that he always had in his mind the wants of the *growing* town, was truly forward looking in public matters. At a time when the Panama Canal was scarcely more than projected, Dr. Allen, on the invitation of his friend, Congressman James A. Tawney, accompanied a congressional committee to visit the Canal Zone.

For the first twenty years of his practice, Dr. Allen's experiences were the arduous ones of the pioneer physician in coping with lack of facilities, traveling with horse and buggy over dusty or muddy roads in open seasons, and with horses and sleigh over ice and snow. An excellent writer, in "The Country Doctor," a beautiful tribute to the early physician, he supposedly depicted his father. A few paragraphs from his pen appear in the chapter on medicine in the county history of 1911.

By 1939 Dr. Allen was in failing health. In that year he became an honorary member of the Mower County Medical Society and applied for honorary, or affiliate, membership in the state and the national medical associations. Early in 1940 he announced the association with him in practice of Dr. O. J. Johnson, of Lyle, Dr. Johnson concurrently to continue his practice in that village.

Arthur West Allen was married on September 14, 1905, to Nellie C. Sutherland, a native of Austin. There were no children of the marriage. When Dr. Allen died, on May 6, 1940, he was survived by Mrs. Allen. Her death occurred about fifteen years later.

It was written in 1911 and was said to the end, "Dr. Allen is a man who will not accept the praise offered him, but his true worth is written in the hearts of the people to whom he has ministered."

J. A. Allen, of Austin, was elected a member of the Minnesota State Medical Society at the meeting held in June, 1869, at Dresser Hall, Owatonna. His name did not appear on the roster after 1874. Apparently he was the only representative

from Mower County until 1880 when Dr. Lyman D. Jackson, of Grand Meadow, and Drs. William L. Hollister and James P. Squires, both of Austin, were admitted to membership. Nothing further has been learned about Dr. Allen. It is believed that he came to Austin in the late eighteen sixties.

Orlenzer Allen, the first physician to settle in Austin, Mower County, came to the city in April, 1856.

Born at Alfred Center, New York, March 17, 1826 (sometimes given 1830), he came west in 1842 with his parents and his twin brother Ormanzo to Milton, Wisconsin. There he attended Milton College and studied medicine with Dr. Rider. In 1856 he was graduated with honors from Rush Medical College, Chicago. He at once took a short graduate course at the New York College of Physicians and Surgeons, on completion of which he began medical practice at Milton. Soon afterward he came to Austin with his wife and children and his brother Ormanzo, who was by then a lawyer. In this city and community the two brothers enjoyed parallel careers of distinction in their respective professions.

Orlenzer Allen was married in Wisconsin in 1847 to Esther Almeda Coon, a successful school teacher. There were five children of the marriage, four sons and one daughter, at least one of whom, Arthur West Allen, was born in Austin. Two of the sons, Abraham and Arthur, became physicians.

Dr. Allen's professional card, in the early days in Austin, announced him to be an eclectic physician. For several years he ran a drugstore in connection with his practice, as did many other physicians of that period. He rendered a various service, as physician, as coroner, and as one of the first physicians to give county aid to the poor. In February, 1859 he and Dr. Hiram L. Coon, also of Austin, presented bills to the county commissioners for this service. In his civic capacity Dr. Allen was county commissioner, justice of the peace, and alderman.

A good citizen and a physician of excellent judgment, Dr. Allen held the confidence and respect of the community. In later years it was written of him that he was a practitioner of "the kindly old school . . . an ideal country physician, kindly, self-sacrificing and able"; and of him and his wife, "Their good deeds will ever be remembered in the county."

Dr. Orlenzer Allen remained in Austin until 1870, when he returned to Milton, Wisconsin. His death occurred there, April 5, 1883, from pleuropneumonia.

Joseph Alloys, the first physician to practice medicine at Lansing, came to the village in 1857. He was then about sixty years old, a short, thickset man, who was a Catholic priest as well as a physician. He soon pre-empted the southeast quarter of section 1 in Lansing Township and began farming in addition to his professional work. It is said that he had a good medical practice and that he ably conducted his medical and clerical duties and his farm until about 1860, when he moved to Chicago.

G. M. Allsdurff (the name appears in various spellings), an early eclectic practitioner in Mower County, was born November 24, 1824, in Sparta, Crawford County, Pennsylvania. Information about his early education and his medical training is lacking. In the autumn of 1864, then nearly forty years of age, Dr. Allsdurff came to southern Minnesota and settled in Le Roy, in the portion of the village called the "old town," the only physician in the settlement at that time. Dr. J. C. Jones and his wife, Thomsonian physicians, had been in the locality since 1855, but on the arrival of Dr. Allsdurff, it is said, they gave up practice.

Happening to arrive during a severe epidemic of diphtheria, Dr. Allsdurff found himself in demand in the counties of Mower and Fillmore in Minnesota, and in the counties of Howard and Mitchell in Iowa, bordering the Minnesota line. Thus established, he continued in successful practice.

When the new village of Le Roy was laid out in 1867, Dr. Allsdurff opened an office there and in 1868 transferred his residence also. After the enactment of the Minnesota Medical Practice Act in 1883 he practiced under an exemption certificate, and was still in practice in 1902 and perhaps a little later, but not in 1904.

R. A. Barnes, born in the East in 1826, served as a surgeon in the Union Army during the Civil War. In the autumn of 1864 he settled in Austin, Mower County. His professional card stated that he had had experience in New York hospitals and that he had practiced in the Middle West, for some time at Mitchell, Iowa. In Austin, he served as county physician, as examiner on the United States Bureau of Pensions, and for many years as coroner. He died in Austin in January, 1878,

from apoplexy and paralysis of the left side at the age of fifty-two years, survived by his wife and two daughters.

Marshall T. Bascomb was born on November 18, 1851, in Mt. Vernon, Ohio, the youngest of the four children of Mr. and Mrs. Newell Bascomb, who in the autumn of 1854 were pioneer settlers in Oronoco, Olmsted County, Minnesota. He obtained his early education in the schools of Oronoco and of Rochester, and in the early eighteen seventies studied medicine at the University of Michigan. In 1875 he was married to Ella B. Cook, daughter of Mr. and Mrs. Martin W. Cook, of Rochester.

There is record that from 1877 to 1879 Dr. Bascomb practiced medicine in Brownsdale and in Grand Meadow, Mower County, and that for a year or more in 1880 and 1881 he practiced at Eau Galle, Wisconsin. In the latter year he enrolled at Western Reserve University, Cleveland, Ohio, from which he received the degree of doctor of medicine on March 14, 1882. Immediately afterward he went to Clark, Clark County, Dakota Territory; under the territorial medical practice act of 1885, he registered on July 9, 1885. While in Clark he was a member of the state board of health, in 1893-1894, and county coroner, 1894.

In 1895, Dr. Bascomb returned to Olmsted County, settled in Pleasant Grove, and operated a drugstore as an adjunct to the practice of medicine. He was an active member of the Olmsted County Medical Society and the Southern Minnesota Medical Association; served as local county physician; was active in numerous fraternal organizations. He was respected and well liked, as a citizen and a physician. He died January 28, 1899, in his forty-eighth year, survived by his wife, two sons, his mother, a sister, and a brother, Edward G. Bascomb, of Austin. E. G. Bascomb was the husband of Carrie M. Wheat, daughter of Dr. and Mrs. John N. Wheat, of Austin.

John S. Beagle, born in 1873, was graduated in 1896 from the Hahnemann Medical College of Chicago, and was licensed in 1897 as a physician in Minnesota. It has been said, erroneously, that he practiced medicine in Chatfield and also in Spring Valley. Dr. Beagle stated in a letter of August 11, 1943, to the writer of the early medical history of Fillmore County, that although he spent his boyhood and youth in Spring Valley and was graduated from the Spring Valley high school, he never was a resident physician anywhere in Fillmore County, but in 1897 began to practice his profession in Rose Creek, Mower County. In 1898 he was married to Fantine Van Loan of Hamilton, Fillmore County. "My life and experience have been those of the ordinary country doctor, beginning in the days of horse and buggy travel." In 1909 Dr. Beagle moved from Rose Creek to Sidney, Montana, where, with the exception of a temporary removal to California, in 1926, he remained.

Charles Severin Beaulieu (1835-1896), physician, preacher, newspaper editor and sometimes politician, was a colorful figure in southern Minnesota from 1868 to perhaps 1890. Eckman and Bigelow gave a detailed account of his life in their history of medicine in Dodge County.

Born in the Department of Loire, France, in 1835, he came to the United States in 1840 with his parents; his father was a political exile. He spent ten years of his boyhood in Canada, and returned to Oswego County, New York. Later he was educated in France for the priesthood, but subsequently renounced his faith and became a convert to Protestantism. Perhaps in France he received his training in medicine. In 1861 he raised a company, of which he became first lieutenant, in the 24th Regiment of New York Volunteers. He was promoted to captaincy, fought in the second battle of Bull Run and in several minor engagements. Probably during his military service he acquired further medical and surgical experience. Some time after leaving the army in 1863 he went to Indianapolis, where he practiced medicine.

In 1868, Dr. Beaulieu settled in Concord, Dodge County, Minnesota, and remained there until November, 1880, when he accepted a call to Brownsdale, Mower County, as pastor of the Christian Church. "He seems to have been a curiously erudite man who could pactice medicine or occupy a pulpit with equal facility." In October, 1882, he was ordained in Minneapolis as evangelist of the Christian Church. During his years in Brownsdale, he practiced medicine and was licensed in the state under exemption certificate No. 723-3 on December 31, 1883. While in that village he became chaplain of the Colonel Henry Rogers Post No. 11 of the Grand Army of the Republic. This post was named for Lieut-Col. Henry C. Rogers (1834-1871) of Brownsdale, who had settled there in 1856. There is record that

Dr. Beaulieu had served as Lieutenant-Colonel of the 9th Minnesota Regiment of Volunteer Infantry, and that he was Secretary of State of Minnesota (1868-1870).

When Dr. Beaulieu left Brownsdale and Minnesota is not known, but he was living in New Haven, Franklin County, Missouri, in 1896. It was reported that he ran the village newspaper and preached in the Christian Church, but that he never practiced medicine in Missouri; in fact, it was not known in the town that he was a physician. He died in De Soto, Missouri, on December 15, 1896. He was married four times; the third wife, whom he married perhaps about 1878, was Lena Green Slocum, widow of Dr. Julius Franklin Slocum (1843-1874), of Marion, Olmsted County. Dr. Slocum was a native of Mantorville, Dodge County, member of a well-known pioneer family.

M. D. Bedal, a graduate of the Chicago Medical College, opened an office in Rochester, Minnesota, in June, 1874, having just completed three years in Cincinnati, Ohio, which he spent attending lectures and practicing in the hospitals. It was reported in Rochester, in the usual manner of newspapers of the time, that he was a young physician of superior attainments and excellent natural abilities. Within a few months he proceeded to Brownsdale, Mower County, where he practiced until the spring of 1876, when he removed to Tekamah, Burt County, Nebraska.

This Dr. Bedal should not be confused with Dr. S. L. Bedal, who spent his boyhood in Olmsted County and read medicine with the Drs. E. C. and E. W. Cross of Rochester in the late sixties or early seventies; nor with Dr. Sylvester S. Bedel, graduate of the Chicago Medical College in 1871, who was in Albert Lea from 1872 to 1874.

Mention has been observed of a **Dr. Bedell or Bidell,** a graduate of a Chicago medical school, who was in Grand Meadow a year or two, probably in the seventies, and went on to Dakota. Record has not been found of such a physician being licensed in Dakota Territory under the medical practice law of 1885.

Erastus Belden and his son **Wallace P. Belden** were pioneer physicians who were known in Fillmore, Mower and Freeborn Counties. Erastus Belden spent some years in Frankford, Mower County; W. P. Belden lived chiefly in Spring Valley, Fillmore County.

Erastus Belden, son of Emanuel Belden, of English descent, was born March 26, 1809, and his wife, Julia Ann Lyons Belden, March 30, 1811; both were natives of New York. Dr. and Mrs. Belden, about 1835, with three young children journeyed to Ohio in search of a new home. After the birth of a fourth child at Elyria, Ohio in 1837 they returned to New York, where they remained until 1853. In that year with their son, Wallace, "a qualified physician," and two younger children, they came into southern Minnesota and shortly afterward settled in the vicinity of Hamilton and Spring Valley. A few years later they moved to Frankford, Mower County.

When Dr. Erastus Belden died at Frankford in February, 1867, the *Rochester Post* paid tribute to him as "a skillful surgeon and a thoroughly posted physician of the old school." He was buried in the Frankford Cemetery, where a large inscribed boulder marks his grave. His wife died a year later in Rochester, Minnesota. (For greater detail, see medical history of Fillmore County.)

Howard Bell, a graduate of the Medical Department of the University of New York City in 1884, was licensed on March 10, 1885 to practice in Minnesota, receiving certificate No. 1008 (R). At that time he was living in Lanesboro, Fillmore County. Little information about him has been available, and the length of his residence in the state is uncertain. It has been learned that for a time in 1885 and into the spring of 1886 he was in partnership with Dr. F. A. Blackmer, in Albert Lea, Freeborn County, and that around 1888 he was briefly in Mower County. Judging from the evidence of official medical directories, he left Minnesota early in the nineties, or sooner, and returned to the East. For many years, until his death in 1923, he was in Delhi, New York.

P. C. Berry, an eclectic practitioner, first visited Austin in 1869. He returned in 1870 and remained for several years. His wife, who at about this time became qualified to practice, assisted him and "offered her services to the ladies of the town." In 1871 Dr. P. C. Berry became a member of the Minnesota State Eclectic Medical Society, at a meeting held in the office of Dr. C. H. Blecken in Austin.

— **Bingham,** said to have been newly graduated from Rush Medical College, was the second physician, from approximately 1865 to 1867, to settle in Le Roy. Mower County, where he was introduced by the Messrs. Coleman. In different accounts it was stated that from Le Roy he removed to Lanesboro, Fillmore County. Possibly he was the Dr. D. W. Bingham who was in Winona in 1865.

The *National Republican* of Preston, Fillmore County, on January 24, 1873, referred to Dr. Bingham as assisting Dr. James Madison Wheat, of Lenora, in performing amputations of a hand and a foot on January 1, 1873; and in another column in the same issue, "We regret to learn of the death of Dr. Bingham, of Lanesboro, by smallpox. Three other cases are reported in that village today."

C. H. Blecken, an eclectic physician, practiced in Austin in 1871. In that year, as has been mentioned, the Minnesota State Eclectic Medical Society met in his office, and at this meeting Dr. P. C. Berry, of Austin, was granted membership. Dr. C. H. Blecken was mentioned briefly in the history of medicine of Goodhue County as having been one of the first three or four medical newcomers in Red Wing in the sixties.

F. Brewer practiced medicine in Austin in 1863, and ran a drugstore and bookstore in connection with his practice.

George S. Brigham, a graduate of the Medical Department of the University of Vermont in 1870, came to Austin from St. Albans, Vermont in 1876 and remained until September, 1878, when he settled in St. Cloud, Stearns County, having "purchased Dr. MacDonald's practice." There is mention of the birth of a son to Dr. and Mrs. Brigham in May, 1880, of Dr. Brigham's having set a broken arm, and, in September, 1881 with Dr. McMasters, having "amputated the leg of an Albany man." In January, 1883, he was appointed examiner for the United States Bureau of Pensions and with two other physicians was to form the examining board of St. Cloud. In June, 1883, he was admitted to the Minnesota State Medical Society and December 31, 1883 was licensed in the state, receiving certificate No. 578 (R). In 1892 he was elected city physician of St. Cloud.

David A. S. Britts came to Brownsdale, Mower County, in July, 1876, and remained there until 1880, except for a few months in 1879 which he spent as assistant surgeon at the Lanesboro Sanitarium with Dr. David Frank Powell (among whose "border cognomens" were White Beaver, the Surgeon Scout, Mighty Medicine Man, and Fancy Frank, some given by his Indian friends and some by his contemporaries among the white population). Dr. Britts became well known in southern Minnesota; several biographical accounts of him have appeared in the medical histories of Olmsted, Fillmore and Dodge Counties and in general county histories.

David Britts was born March 1, 1844, in Montgomery County, Indiana, and lived in Wisconsin from early childhood to 1862 when he came to Dodge County, Minnesota with his parents. Soon afterward he enlisted in Company M of the First Regiment of Mounted Rangers and with it served in the war against the Sioux Indians. This period was followed by military service with other regiments. After his discharge from the army because of disability incurred in the service, he attended the seminary at Wasioja, obtained his medical training at the Chicago Medical College and began practice at Marion, Olmsted County in the early seventies. In Brownsdale November 23, 1879 he was married to Alice M. Stevens of that village (in one account her name was given as Ella (Stevens) Hamlin).

In 1880, Dr. Britts went from Brownsdale to Clearwater, Wright County. In 1887 he was licensed to practice under an exemption certificate. Prior to 1904 he settled in Minneapolis. His name was included for the last time in the 1914 edition of the directory of the American Medical Association.

A. M. Brown came from Marble Rock, Iowa, to Lyle in 1883 and practiced there for a short time.

John W. Burchard practiced medicine in Brownsdale in 1891, later returning to South Dakota. He was for a time the editor of the *Brownsdale News.* It has been noted that John W. Burchard, Carthage, Miner County, Dakota Territory, a graduate of the University of Buffalo, New York in 1884, was licensed in Dakota August 27, 1887.

(To Be Continued)

President's Letter

VARIATIONS ON AN ESSAY ON POLITICS

> "The wise know that foolish legislation is a rope of sand, which perishes in the twisting; that the State must follow and not lead the character and progress of the citizen; the strongest usurper is quickly got rid of; and they only who build on Ideas, build for eternity; and that form of government which prevails is the expression of what cultivation exists in the population which permits it."
>
> —Ralph Waldo Emerson, *Essay on Politics*

Why are congressmen so willing to go to great lengths to justify compulsory health legislation in the United States when the system is faltering in other nations? Ours is the only nation left in the world without a compulsory health care status.

In spite of this, we are now giving and will continue to give our people the highest standard of medical care in the world.

The medical profession is better informed today on health legislation than at any other time in its history. Our freedom to express our views on health legislation, and above all the privilege to participate as individual citizens in the promotion of good government, continues to prevail.

Seldom has more constructive effort been expended on behalf of the medical profession and its allies to bring to the attention of the people the danger involved in unwise legislation for care of the aged.

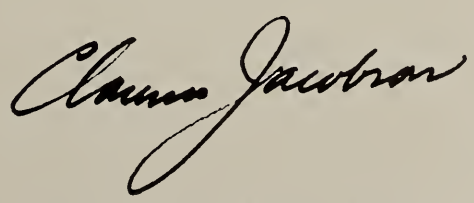
These efforts fortunately averted what, in all probability, would have been the first step toward a welfare state.

Both houses of Congress approved the amended version of H.R. 12580, and the Bill has received the signature of President Eisenhower.

The original Forand Bill can now be revealed in retrospect in the light of its imperfections and dire implications.

Once again, we have been given a precious respite which will enable us to build future plans based on broader and better documented surveys. Your attention is directed to the editorial page of the *AMA News* of September 6, 1960, which summarizes surveys recently completed on the subject; one from the National Opinion Research Center, University of Chicago; another entitled, "A Profile of the Aging U.S.A." from Emory University in Atlanta, Georgia. These surveys were made by interviewing the aged themselves with nearly parallel results. Similar surveys were made by the University of Kentucky and U. S. Department of Agriculture in a low income area, revealing that only 5.3 per cent of the aged men and 3.6 per cent of the aged women stated that they were unable financially to meet their health needs. We hope that the forthcoming White House Conference will reveal the whole picture, including our future attitudes toward a useful aging population.

Our sustained efforts to maintain high standards of practice, backed by sound political support will give our nation assurance of continued medical progress.



President, Minnesota State Medical Association

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.

DELINQUENCY PRONE PERSONALITIES

I. Definitions and Types

The many social, judicial, and psychological problems involved in the phenomenon called delinquency have received considerable attention in recent years from the public and the press, various government agencies and officials, as well as from professional persons in psychiatry, psychology, sociology, law, education, and social work. What most concerns those representing society in general are the two questions: (1) what to do with the offender once apprehended and (2) what to do about an apparently increasing crime rate. These questions are now reflected in the actions of the courts which are not only concerned with establishing the guilt of the suspect but are also concerned with his rehabilitation. While the formalities of the law specify the procedures for establishing guilt, the rehabilitation of the offender is quite a new field.

Delinquency—and crime, however, are also matters which concern the theologian as well as the judge. Here the questions relate not directly to the individual's relations with society but to his relations with God and with himself. The ethical question is not whether a given act is illegal, but whether it is immoral. Most illegal acts would be considered immoral by churchmen, of course, but the reverse is much less frequently true. Guilt in this sense has more to do with its relationships to conscience and to will; and punishment is penance directed toward the restitution of God's grace.

Whichever of these views one may emphasize—and they are closely interwoven in this country, further questions arise: What leads to such behavior? How may it be prevented? How may the offender be rehabilitated? These are questions of learning; since the culture, whether in its secular or theological influences, aims to teach children to be governed by certain rules and principles.

An understanding of the dynamics of character formation not only focuses upon learning but also introduces the questions of constitutional pre-disposition. Therefore, both the possibility of a learning failure and the possibility of a constitutional failure might explain delinquency. On the other hand, there are those who emphasize that particular social stresses operating in given subcultures tend to produce aberrant behavior. In its extreme, this view suggests that whatever the individual's personality may be, the critical factors are those environmental situations which mold behavior along destructive lines. Much sociological research has shown that there is high association between crime and circumstance.

There are no conclusive research data to support any bias. The broadest generalization that can be made is probably that some concatenation of personality characteristics in a given social situation leads to delinquent behavior as one manifestation of a generally unhealthy personal-social interaction. We do not know precisely the nature or development of these personality characteristics, nor do we know exactly the threshold of social stress required to precipitate antisocial behavior. A reasonable hypothesis might be that in some constellations of personal dynamics, the individual needs little "real" threat to act, since the degree of psychopathology is so acute, his distortion of reality so great, and the act so idiosyncratically meaningful, that asocial or antisocial behavior is a highly probable outcome. In other cases, there appears to be evidence that whatever an individual's emotional disposition, experiences and stress of specific sorts are likely to produce criminal behavior whatever internal factors may be present.

Wirt, Briggs, and Golden,† in a recent research design, have stressed that the study of delinquency becomes obscured if the symptom of antisocial behavior is set apart as the defining criterion of some supposed personality type. Delinquency is a social criterion, describing persons who have trouble with the law. Some individuals are more likely than others to develop antisocial patterns, but to understand them we must not lump them all together, but rather refine the subgroups contributing the

largest numbers of delinquents. Wirt, Briggs, and Golden assign these to five general categories as follows:

1. *Diagnostic Category One.*—Delinquency primarily due to lack of emotional integration of the family. Such families provide ineffective example setting and disciplining for developing a social conscience. The family is hence an ineffective mediator of positive social values and the youngster is receptive to the least desirable influences emanating from associates and mass media of communication.

2. *Diagnostic Category Two.*—This includes cases where the antisocial disorder is primarily the result of the child responding to an integrated home, but where the child fulfills the conscious or unconscious antisocial impulses and desires of the parents. Such families have been most intensively studied by Johnson and Szurek.*

3. *Diagnostic Category Three.*—This includes those cases where antisocial behavior is primarily the result of disorder within the child. For example, where the siblings may be making an adequate adjustment, but the delinquent youngster suffers from a sociopathic, schizophrenic, neurologic, low intellect, or severe neurotic syndrome promoting antisocial behavior.

4. *Diagnostic Category Four.*—This includes the adolescent without major home or personality disorder whose normal hyperactivity and rebelliousness cannot be constructively integrated by his present environment because of a lack of acceptable outlets.

5. *Diagnostic Category Five.*—This includes those children whose delinquency is largely a result of efforts to seek or maintain status in their peer group.

Subsequent articles deal with each of these syndromes and with methods of diagnosis and treatment.

Robert D. Wirt
Peter F. Briggs
University of Minnesota

*Johnson, Adelaide M., and Szurek, S. A.: The genesis of antisocial acting out in children and adults. *Psychoanalytic Quart.*, 21:323-343, 1952.

†Wirt, R. D., Briggs, P. F., and Golden, Jules S.: Classification study of juvenile delinquency. NIMH research grant application, 1960.

HERITABLE DEFECTS IN ERYTHROCYTE METABOLISM, WITH SPECIAL REFERENCE TO HEMOLYTIC SYNDROMES

Erythrocyte glucose-6-phosphate dehydrogenase (G-6-P. D.) deficiency is associated with increased susceptibility to hemolysis following the ingestion of various drugs or fava beans and during the course of viral and bacterial infections. In addition, this enzyme deficiency is associated with certain cases of non-spherocytic congenital hemolytic anemia.

This enzyme deficiency is genetically determined and is probably due to a sex-linked gene of intermediate dominance. The incidence of this trait varies, being in excess of 10 per cent among American Negroes and Caucasians of Oriental, Jewish, Greek and Sardinian extraction, while it is uncommon among Javanese and South American Indians and rare among Western Europeans and Chinese.

Studies of G-6-P. D. deficiency afford a model for examining the nature of gene action in man.

Evidence has been obtained that this genetically determined enzyme deficiency is more severe in affected Caucasians than in affected Negroes. In addition, the expression of this trait is variable in different tissues of an affected subject. Thus, in affected Negroes and affected Caucasians, G-6-P. D. activity is lower in erythrocytes than in leukocytes, platelets or liver.

To elucidate the mechanism by which this mutation gives rise to G-6-P. D. deficiency, studies have been made of the properties of this enzyme in crude hemolysates and purified preparations from red cells of normal and affected Negroes. The normal and mutant enzymes have been found similar in catalytic and physiochemical properties. However, the mutant enzyme is more readily inactivated by stroma than the normal enzyme. This inactivation is blocked by triphosphopyridine nucleotide or nicotinamide. It appears that the mutation involves a decreased stability of G-6-P. D. in the crude cell lysate which is not detected upon purification of the enzyme.

A simple assay system has been devised which is reliable in detecting subjects with a marked G-6-P. D. deficiency.

Paul A. Marks, M.D.
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ACQUIRED VIRILISM

Excessive androgen production resulting in masculinization characterizes several well known disorders of the ovary and the adrenal cortex. However, few virilized women seen in clinical practice have a known pathologic entity such as congenital adrenal hyperplasia, arrhenoblastoma or adrenocortical tumor. Many patients presenting problems of hirsutism, menstrual irregularity and infertility have no demonstrable endocrine defect, or if abnormal hormone secretion is present, the source and nature of the defect may be difficult to identify. Of these patients some have polycystic ovaries, and the clinical remission which may follow wedge resection is suggestive evidence that the ovary is the source of the virilizing hormones. However, cystic ovaries have been observed in some patients with known virilizing disorders of the adrenal, and fractionation of 17-ketosteroids from urine of virilized patients with cystic ovaries has yielded results interpreted by some to indicate that hypersecretion of adrenal androgens is the real cause of the syndrome. On this basis the use of glucocorticoids has been advocated to suppress the adrenal hyperfunction and thus correct the hirsutism and the ovarian dysfunction.

The mechanism by which excessive secretion of adrenal androgens might lead to altered ovarian histology and function is speculative. It has been stated that the hormonal hypersecretion in the adrenogenital syndrome suppresses pituitary gonadotropin, thus leading to ovarian hypofunction. Yet several investigators have reported that hypersecretion of pituitary gonadotropin, primarily ICSH, occurs in patients with the Stein-Leventhal syndrome. The latter finding is compatible with the observation that virilization and polycystic ovaries can be induced by prolonged administration of chorionic gonadotropin, a hormone with biologic effects similar to those of ICSH. It seems unlikely that an adrenal secretion, suppressive of gonadotropic function, could produce ovarian changes which are more likely to result from excessive or unbalanced gonadotropin secretion.

Evidence is lacking that the virilizing hormones from the adrenal actually suppress pituitary gonadotropins. Of five adult patients with untreated adrenogenital syndrome studied by the writer, all excreted normal amounts of urinary gonadotropins and none had clinical evidence of ovarian function. With adrenal suppressive therapy gonadotropin titers of these patients fell as ovarian function was restored. In mildly virilized women, with or without polycystic ovaries, gonadotropin titers are generally within the normal range and glucocorticoid therapy, with sustained suppression of 17-ketosteroid excretion, produces no significant change in total gonadotropin levels although improvement in ovarian function results in some cases.

This evidence that gonadotropins are not suppressed in virilized patients raises the question of what affects may be observed by treatment which does suppress gonadotropins. Estrogen, the most potent inhibitor of gonadotropins, has been found to reduce to a significant degree the urinary 17-ketosteroid levels in most virilized patients. With prolonged therapy reduction in size of the enlarged polycystic ovaries and some improvement in hirsutism have been observed. Although these results suggest that a virilizing ovarian secretion has been suppressed, similar effects of estrogen have been observed both in normal subjects and in women excreting excessive amounts of 17-ketosteroids of adrenal origin. The mechanism of action of estrogen, now considered to be non-specific, is dependent upon increased plasma binding of 17-ketosteroid precursors and a decrease in the rate of their degradation.

Acquired virilism of mild degree is a common clinical complaint. Although in many cases no endocrine etiology for the masculinizing tendency can be demonstrated, in others increasingly specific analysis of blood and urinary steroid levels, especially when combined with observations of the effects of adrenal stimulation and suppression, have demonstrated otherwise obscure variations from normal. Review of such studies in 100 virilized patients examined in the Endocrine Clinic of Henry Ford Hospital failed to reveal any endocrinopathy in 40. Adrenogenital syndrome was diagnosed in six and gonadal dysgenesis in two. There were 25 patients with polycystic ovaries who excreted quantitatively normal amounts of urinary 17-ketosteroids and 17-hydroxycorticoids, and whose urinary steroid responses were normal both to administered ACTH and to suppression with glucocorticoids. The remaining 26 patients, considered to have adrenocortical dysfunction characterized by hypersecretion of androgens, had greater than normal amounts of 17-ketosteroids in urine while 17-hydroxysteroid levels were normal. The elevated

androgen/glucocorticoid ratio was maintained during stimulation with ACTH, and adrenocortical function could be suppressed in all cases by administration of glucocorticoids, excluding functioning adrenal tumors from diagnostic consideration. However, abnormal levels of pregnanetriol, the hallmark of congenital virilizing adrenal hyperplasia, were not encountered.

That these are two clinically significant groups of patients—those with polycystic ovaries without adrenocortical dysfunction, and those with adrenocortical dysfunction with or without polycystic ovaries—is suggested by the results of therapy. Prolonged adrenal suppression by oral glucocorticoid therapy proved beneficial only in the adrenocortical dysfunction group where improvement occurred in two-thirds of the cases. When polycystic ovaries were present, wedge resection was followed by a return of ovulatory menses or fertility in 20 of 22 cases, even when adrenocortical dysfunction was considered the primary disturbance. In the absence of adrenal dysfunction, glucocorticoid therapy led to disappointing results, but in properly selected cases regulation of menses and diminishing hirsutism was achieved. In some patients suppression of the elevated 17-ketosteroids has been observed long after glucocorticoid therapy is discontinued. Ovarian wedge resection does not lower total 17-ketosteroids, nor reduce the hypertrichosis.

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THE HONORARIUM

Webster's Dictionary defines an honorarium as an "honorary payment or reward usually in recognition of gratuitous or professional service for which custom or propriety forbids any fixed business fee to be set or for which no payment can be enforced at law."

Such is the definition, but when, through common courtesy, may an honorarium be omitted? When a speaker comes from a short distance with little or no loss of time from his work, the command is less; whereas, when the individual comes from a great distance with a loss of time from his business, a suitable honorarium is obligatory. This philosophy has met with general acceptance.

Recently, honorariums have been suggested and granted under unusual circumstances. An honorarium was suggested for a medical speaker who participated in a medical program in his own city. Honorariums have been granted by a local medical group to speakers who journeyed about ten miles to address their meetings. There is some question as to whether or not this procedure increased the prestige or attendance at the meetings, since the subject matter, as well as the speaker, was familiar to many of those present.

What has happened to the previous gracious acceptance by speakers to address organizations within their area without fee? Is this to be a thing of the past, and are we to pursue the philosophy of Trade rather than of Profession?

It may be well again to read the Hippocratic oath and accept again our responsibility—

"To teach them this art, if they require to learn it, without fee or indenture; and to impart precept, oral instruction and all other learning to my sons, to the sons of my teacher and to pupils who have signed the indenture and sworn obedience to the Physicians' Law."

Anonymous

Editor's Note: The anonymous author of the preceding editorial points out a difference between speaking before a medical group for pay and speaking to advance medicine. He apparently laments a token recognition of the long hours of creative work which must precede the presentation of a scientific manuscript. From an editor's viewpoint, the predominant drones in our medical societies might cultivate a much keener appreciation of their contributing colleagues' efforts. The original articles in Minnesota Medicine cost each of the authors over $1,000.00. The society of 3,000 recipients of these gifts should be able to afford 100 free reprints for the physicians who prefer to practice rather than preach the Hippocratic precepts.

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

ANALYSIS, REVIEW AND EVALUATION OF CLINICAL PRACTICE IN THE HOSPITAL REVIEWED

Only physicians are capable of judging what is or what is not good medical practice. Patients and hospital personnel may learn to recognize good practice, but only the physician can accurately evaluate its quality, is the view expressed by Kenneth B. Babcock, M.D., Director of the Joint Commission on Accreditation of Hospitals, in the August *Bulletin* of that organization.

Member organizations of the Joint Commission include the American College of Physicians, American College of Surgeons, American Hospital Association and the American Medical Association.

The opinions of individual physicians vary and rightly so. For that reason, the Commission places heavy emphasis on group participation in evaluating clinical practice. It is the responsibility of the entire Active Medical Staff to analyze, review and evaluate the clinical practice in the hospital and to insist on high standards of performance from each of its members.

This responsibility is not easily discharged, points out Dr. Babcock. It requires hours of work which the busy physician can ill afford to spend and which is usually done at the expense of his personal pleasures. It requires an objectivity which is perhaps even more difficult to achieve. To judge the work of a colleague on a fair, unbiased, impartial level calls for the intelligence and wisdom of a Solomon. That this is so well done in thousands of hospitals can be attributed to the integrity, effort and persistence of each member of the medical staff.

Essentials

In order to evaluate clinical practice, Dr. Babcock enumerates the following essentials:

1. *Reliable Medical Records.*—There must be evidence on the medical record that the diagnosis was made on the basis of information given by the patient in the history, a careful physical examination, and a scientific interpretation of the findings. There must be sufficient data recorded to justify the physician's treatment of the patient and the results. For the sake of both the group whose responsibility it is to review the record and the physician whose performance is being evaluated, a good medical record is indispensable.

2. *Reliable Reports of Diagnostic Tests.*—The physician must rely on the accuracy of reports on laboratory and diagnostic tests. The medical staff cannot supervise all these areas, but it has a responsibility to make certain that there is supervision. This is done by recommending the appointment of qualified individuals to head these departments and to designate those on the staff qualified to interpret electrocardiograms, x-rays, and other diagnostic tests. If laboratory work is done outside the hospital, it must be made certain that these laboratories are government approved, licensed and under the direct supervision of a pathologist.

3. *An Organized Medical Staff.*—To insure a continual orderly process of evaluating clinical practice, the medical staff must be formally organized. This provides a framework in which the duties and functions of the staff can be carried out. The medical staff may decide to delegate the responsibility of clinical review to committees, to clinical departments or to the staff as a whole. Only the individual medical staff can determine the method which will be most effective in the local situation.

4. *A Competent Medical Staff.*—Though listed fourth, the most important factor in evaluating clinical practice is a competent medical staff. The quality of medical care in the hospital is in direct ratio to the knowledge, experience and ability of the members of the medical staff. The judgment necessary to evaluate clinical practice depends entirely on the ability of those who are doing the evaluating.

This makes the appointments to the staff and the delineation of privileges so important. To do this fairly and objectively, the medical staff should set up a system to evaluate each applicant and determine his hospital privileges on the basis of professional competence. Individual character, training, experience and ability should be the criteria for selection. Under no circumstances

should the accordance of staff membership or professional privileges in the hospital be dependent solely upon certification, fellowship or membership in a specialty body or society. Neither should appointments be denied on the basis of hospital bed capacity or selfish competitive motives on the part of the staff.

Although the primary purpose of clinical review is to achieve and maintain high standards of patient care, the process also serves as a means of evaluating the performance of individual staff members. The judgment, ability and competence of a staff member can be assessed by his methods of diagnosis, his skill in treatment and his ability to recognize situations which call for consultation. These facts should influence the decision to extend or limit his hospital privileges. Each member of the staff should be given the opportunity to realize his full capabilities, and at the same time safeguards must be established to protect patients. By good clinical review both patient and staff member profit.

The Commission in accrediting a hospital places great emphasis on the extent and care with which the medical staff reviews and evaluates clinical practice. Since good medical records, reliable diagnostic services and a competent, well organized staff are essential for good clinical review, these factors are closely surveyed. To be accredited, there must be evidence that the hospital medical staff is living up to its important responsibilities.

PHYSICIANS IN FIGHT FOR HEALTH CARE FOR THE AGED

On August 29, 1960, the Senate accepted H.R. 12580, 86th Congress, as reported by the Conference Committee, by a vote of 73 to 12. The House had accepted the measure, as reported by the Conference Committee, on August 26, by a vote of 368 to 17.

On August 23, 1960, the Senate rejected two major amendments to H.R. 12580, 86th Congress, as amended and reported by the Senate Finance Committee. Among those leading the fight in that Senate to defeat the "Anderson-Kennedy" amendment were Democratic Senators Harry Byrd, Virginia; Robert S. Kerr, Oklahoma; and Russell B. Long, Louisiana; and Republican Senators John J. Williams, Delaware; Carl Curtis, Nebraska; and Wallace Bennett, Utah.

Anderson-Kennedy Amendment

By a vote of 51 to 44 the Senate turned down an amendment sponsored by Senator Anderson, Senator Kennedy and eight other Democratic Senators which would have authorized hospital, nursing home, home nursing and diagnostic and x-ray benefits for nine million persons, aged sixty-eight and older, who are currently eligible for social security benefits. This plan would have been an addition to the Mills bill, as reported by the Senate Finance Committee, and would have been financed by a 0.5 per cent increase in the social security (¼ per cent increase for employee and employer). Proponents of the increase claimed it would finance the estimated $700 million needed the first year and the estimated cost of $1 billion after the first year.

Javits Amendment

Also on August 23, 1960, the Senate rejected the Javits amendment by a vote of 67 to 28. This amendment, which had the backing of the Administration, would have authorized a participating health benefits plan for 11 million persons aged sixty-five and over, who are not now receiving public assistance. This plan would have excluded individuals with annual incomes over $3,000 and couples with annual incomes of more than $4,500.

Long Amendment

The Senate passed by a vote of 51 to 38 (11 not voting) an amendment to H.R. 12580, 86th Congress, as reported by the Senate Finance Committee, which would eliminate the prohibition of payment to or care in behalf of individuals who are in tuberculosis or mental hospitals.

H.R. 12580, 86th Congress, As Passed by the Senate

At 8 p. m. on August 23, the Senate voted 91 to 2 in favor of H.R. 12580, 86th Congress, as amended by the Senate Finance Committee and as further amended on the floor of the Senate. Several amendments were made to this measure on the floor of the Senate following the defeat of the Javits amendment and the Anderson-Kennedy amendment. Only the Long amendment had any medical significance, however.

The bill, as passed by the Senate, consists of seven titles which would provide extensive amendments to the Social Security Act, including a federal-state matching grant program under which

medical care would be financed for the near needy aged and increased financial participation by the federal government in medical care programs under Old Age Assistance.

Title I

This title deals with coverage under the OASDI program. It contains amendments relative to the election of coverage by ministers, coverage for state and local government employees, employees of non-profit organizations, American citizens employed by foreign governments, domestic service and casual labor. It would provide that municipal and county hospitals would be considered as separate retirement systems, thus allowing them to make an election for social security coverage for their employees, notwithstanding the fact that the city or county has rejected coverage for its employees.

Title II

This title would amend the provisions dealing with eligibility for benefits.

Title III

Among other things, this title would provide for increases in benefit amounts for children of deceased workers.

Title IV

This title would eliminate the age fifty requirement for eligibility for disability insurance benefits. It would also eliminate the six-month waiting period for disability benefits for an individual whose disability had been terminated and who again became disabled within a five-year period.

Under existing law, disabled persons who return to work under a state approved vocational rehabiliation plan continue to draw benefits for up to twelve months even though they are engaged in substantial gainful activity. Individuals who rehabilitate themselves or who are rehabilitated under a program other than a state rehabilitation program do not have this benefit. This title would amend the law to provide that any disabled individual would be granted a nine-month (not necessarily consecutive) trial work period in which he could perform substantial services without losing his benefits. If he were determined to be able to engage in substantial gainful activity, his benefits would be terminated three months later. An individual whose condition improves, regardless of the trial work period, would receive benefits for three months following the determination of his ability to engage in substantial gainful activity.

This title would also liberalize the coverage requirement for certain individuals disabled before 1955. Existing law requires that to be eligible for disability benefits the individual must be fully insured, i.e., coverage in one out of every two quarters of coverage elapsing after December 31, 1950, or forty quarters of coverage, and have coverage for five years in the ten years preceding the onset of disability. This title would authorize benefits for an individual who had twenty quarters of coverage and coverage in all quarters elapsing after 1950 and before the onset of disability, if he had coverage for a minimum of six quarters.

Title V

This title contains amendments dealing with unemployment compensation.

Title VI

This title would revise and amend Title I of the Social Security Act under which Old Age Assistance is provided to authorize federal participation in approved state plans to furnish medical assistance on behalf of aged individuals who are recipients of Old Age Assistance and for individuals not on Old Age Assistance whose income and resources, as determined by the state, are not sufficient to meet the costs of necessary medical services.

While some of the requirements of the state plan for Old Age Assistance (including medical care) and those for medical assistance for the aged not under OAA would be identical, the amended bill would also establish specific requirements for each program. Those which would apply to both programs would require a state plan to provide:

1. That it will be in effect in all political subdivisions of the state.
2. For financial participation by the state.
3. That it will be administered by a single state agency.
4. A fair hearing for an individual whose claim for benefits is denied.
5. Such methods of administration as are found necessary by the Secretary of the Department of HEW for proper and efficient operation (except that the Secretary would not have

authority with respect to the selection, tenure of office and compensation of any individual employed under standards established by the state).

6. For making reports as required by the Secretary of Health, Education and Welfare.
7. For non-disclosure of information regarding applicants and recipients.
8. An opportunity for an individual to apply for assistance which would be furnished with reasonable promptness to those eligible.

State plans which would apply only to Old Age Assistance programs would have to provide:

1. That the state agency, in determining eligibility, would take into consideration any other income or resources of the individual.
2. Reasonable standards for determining eligibility, for and the extent of such assistance.
3. A description of services to be provided, including the utilization of other agencies providing similar services.
4. If the plan includes payments to individuals in private or public institutions, for the designation of a state authority which would be responsible for establishing and maintaining standards for such institution.

With the exception of No. 2, the above requirements are substantially similar to the requirements contained in existing law.

If the state plan also includes medical assistance for the aged not under Old Age Assistance, it would have to provide:

1. For the inclusion of "some" institutional and "some" non-institutional care and services.
2. That no fee or charge will be imposed as a condition of eligibility.
3. For the furnishing of assistance to residents of the state who are temporarily absent therefrom.
4. Reasonable standards for determining eligibility for and the extent of such assistance.
5. That no lien will be imposed on the property of the individual prior to his death and that there will be no recovery until after the death of such individual and his surviving spouse, if any, for any medical assistance correctly paid on behalf of such individual.

"Medical assistance for the aged" would mean "payment of part or all of the cost of the following care and services for individuals sixty-five years of age or older who are not recipients of Old Age Assistance, but whose incomes and resources are insufficient to meet all of such costs—(1) Inpatient hospital services; (2) skilled nursing home services; (3) physicians' services; (4) outpatient or clinic services; (5) home care services; (6) private duty nursing services; (7) physical therapy and related services; (8) dental services; (9) laboratory and x-ray services; (10) prescribed drugs, eyeglasses, dentures and prosthetic devices; (11) diagnostic screening and preventive services; and (12) any other medical care or remedial care recognized under state law."

Note: The bill as passed by the Senate contains no definitions or limitations on the above services as did the House-passed version.

As under the existing Old Age Assistance program, the federal government would contribute four-fifths of the first $30 ($24) of the average monthly payment per recipient, plus a "federal percentage" (50 to 65 per cent, depending on the state's relative per capita income) up to a maximum of $65 ($17.50-$22.75) per recipient.

In addition, the bill generally would provide an increase in the federal contribution of 50 to 80 per cent of sums expended in medical vendor payments up to a maximum of $12.

An alternative formula would provide for a 15 per cent increase in the "federal percentage" (from 50 to 65 per cent to 65 to 80 per cent) of amounts expended for medical or remedial care for Old Age Assistance recipients up to a maximum of $12 per recipient.

For those states which provide a program of medical assistance for the aged not under OAA, the federal government would contribute 50 to 80 per cent of the cost of the program.

Under both programs the federal government would also contribute one-half of the administration cost.

The report of the Conference Committee was accepted by the House on August 26 and by the Senate on August 29. The bill was sent to the President for his signature and became effective as of October 1, 1960.

Public Health

SURVEY OF DIETARY SERVICES IN MINNESOTA HOSPITALS

A comprehensive study of dietary departments in Minnesota hospitals has resulted in several recommendations which are now being submitted to hospital officials. These recommendations indicate that:

1. Intensified efforts should be made to attract students into the field of dietetics.
2. The interest of dietitians in giving service to small hospitals should be stimulated.
3. Educational programs should be instituted for non-professional food service personnel.
4. In planning new hospital construction or remodeling, more careful consideration should be given to the dietary department.
5. Programs and/or materials should be developed to acquaint hospital administrators, boards and others with the elements of a good dietary department and the role of a dietitian in the over-all operation of a hospital.

These survey results are reported in an article entitled, "The Dietary Department in a Small Hospital," by Ardelle Lofquist, B.S., Helen Knudsen, M.D., M.P.H., Bernard Wolcyn, Ph.D., and Robert White, Ph.D., which appeared in the *Journal of the American Dietetic Association* (37:32-37, July 1, 1960).

This study of dietary departments of Minnesota hospitals comprises one segment of a larger project known as "Demonstration and Study for Improving Patient Care" which has been supported by the United States Public Health Service and conducted by the Hospital Services Demonstration Program of the Minnesota Department of Health. Comparable studies were undertaken concurrently by consultants in each of four other paramedical areas: nursing anesthesia, medical records, medical technology and physical therapy.

This project was an outgrowth of earlier work supported by the W. K. Kellogg Foundation and aided similarly by the sponsorship of the Minnesota State Medical Association, Minnesota Hospital Association, Minnesota Department of Health and related professional groups, one of which was the Minnesota Dietetic Association.

The survey in 1957-58 was made by means of personal visits to each of 152 of the 181 licensed general hospitals in Minnesota. These hospitals with 135 beds or less were located in cities of 16,000 or under in population. In most instances the information was obtained from both the hospital administrator and the person in charge of food service by means of a questionnaire consisting of 177 items. These items were grouped into ten main categories: general information, menu planning, food purchasing, food storage, food preparation, food service to patients, modified (special) diets, food service to employees, records and sanitation.

The findings in the survey are reported to present a summary picture using two factors: (1) bed size, and (2) personnel in charge of dietary departments. The major findings of dietary departments of 152 general hospitals in Minnesota are given below:

1. Thirty-two dietitians and four home economists supervised 38 dietary departments of hospitals under 135 beds in rural Minnesota.
2. Hospital administrators are willing to give food service personnel time off with pay, travel and tuition expenses to provide them with short course training.
3. Administrators in 18 per cent of the hospitals expressed a need for more information on their own part regarding operation of a dietary department.
4. One-third of the 116 hospitals not employing a dietitian indicated that they would hire a dietitian, full or part time, if such were available.
5. Only 43 hospitals have written procedures to guide food service personnel in their day-to-day work.
6. Approximately one-half of the hospitals did little or no advance menu planning.
7. In approximately one-half of the hospitals, there was a storeroom solely for food and kitchen supplies, near, or in the kitchen. While refrigerator space appeared to be adequate, one-third of the hospitals did not have enough freezer space.
8. Of the ten major categories studied, cooks felt most competent and administrators were most satisfied with food preparation.
9. A centralized type of tray service was the most common method of assembling and distributing patients' food. Transporting of trays to patient areas was made by dumb-

waiter, unheated open carts or heated tray carts in descending order of occurrence.

10. The average labor time expended by food service personnel per meal served was 16.6 minutes.

11. In over one-half of the hospitals no standard diet manual was used as a guide for hospital personnel to aid in the interpretation of physicians' diet orders. Diet manuals were employed in almost all hospitals with dietitians.

12. Approximately one-fourth of the patients in hospitals were on modified diets (excluding soft and liquid diets).

13. Dietary instructions were given to patients in all hospitals employing dietitians. In hospitals without dietitians copies of diets were issued to patients by physicians, nurses and others.

14. All but one hospital served meals to employees; however, this service varied from the "help yourself in the kitchen" arrangement to waitress service in the dining room.

15. Smaller hospitals tended to furnish meals without charge to employees as a part of their salary. In larger hospitals, charges were made in a variety of ways: cash, meal tickets and salary deductions.

16. The dietary departments in only three hospitals used an operating budget; however, approximately one-third of the hospitals kept records regarding per day or per meal food costs.

17. A high percentage of the hospitals providing pre-employment physical examinations to food handlers repeated examinations annually. Seventeen hospitals required no physical examinations of food handlers.

Conclusions taken from the above findings are included here to provide a basis upon which to develop programs to meet the needs and achieve the aims of the Study.

1. Hospitals employing dietitians provided more complete supervision and management of the food service to patients and employees through:
   (a) Menu planning, which provided nutrients to meet the Recommended Dietary Allowances of the National Research Council and the use of selective and cycle menus;
   (b) Standardized recipes;
   (c) Purchasing according to preplanned menus;
   (d) Better utilization of equipment;
   (e) Records to indicate current food and labor costs;
   (f) Good sanitary practices;
   (g) Simplification and accuracy in therapeutic diets;
   (h) Patient education; and
   (i) Consulting with physicians.

2. There is a marked shortage of dietitians. Only one-third of all the hospitals in Minnesota had the services of a dietitian and the remainder were staffed by persons with essentially no professional training in dietetics.

3. A need exists for improvement in hospital dietary departments where dietitians or home economists are not employed. Hospitals recognize this need to improve their food service, as evidenced by interest in three essential activities:
   (a) Employing professionally qualified persons to direct dietary departments;
   (b) Participating in educational programs for non-professional food service personnel who are presently employed; and
   (c) Using educational materials to guide the operation of dietary departments.

4. Although most of the hospital dietary departments were adequately equipped, better utilization of existing equipment and facilities would improve the food service in many hospitals.

5. A more complete understanding of the various aspects of a good dietary department by hospital administrators, board members, medical staff, and nurses is a necessary first step in the improvement of food service in hospitals.

6. Many hospital administrators see the planning of therapeutic diets as comprising nearly the complete role of the dietitian and are unaware of the other contributions a dietitian can make toward the improvement of patient care and an efficient food service.

An approach has already been made toward dietary improvement of patient care in hospitals. A state-wide educational program through regional courses directed to food service personnel in hospitals is underway. Based on survey information the material is intended to cover normal nutrition, menu planning, modified diets and sanitation. Short courses have been held in four areas in Southern Minnesota; in addition, seven others are being considered for future courses.

The other suggested broad recommendations of encouraging dietitians to give service to small hospitals, planning for better food service facilities, recruiting new and "retired" personnel and informing administrators and hospital boards must be considered on long-term bases. Fulfillment can only be brought about by cooperative effort on the part of all organizations interested in gaining better hospital care and services for all patients.

Committee Action

TUBERCULOSIS CONTROL—PRINCIPLES

I. The eradication of tuberculosis continues to be dependent upon the continuation and intensification of the methods which have led to the present appreciable decrease in tuberculosis mortality, morbidity and rates of tuberculin conversion.

II. Control and eradication of tuberculosis continues to require, (1) intensive case-finding, (2) total treatment of active tuberculosis, and often certain inactive cases, (3) adequate follow-up examinations of all inactive cases, (4) education of the general public and professional groups, (5) rehabilitation in the broadest sense, (6) clinical and basic research, and (7) prevention.

III. Case-finding and diagnosis remain the cornerstones of tuberculosis control and require:
- (1) Routine chest x-ray examination of hospital and institutional admissions, including private and public general and specialized hospitals, penal institutions, nursing and rest homes.
- (2) Routine chest x-ray and tuberculin surveys when indicated and practical.
- (3) Routine chest x-ray studies of all positive tuberculin reactors, found on individual examinations or as the result of tuberculin surveys.
- (4) Life-time follow up examinations of all ex-tuberculous patients and all tuberculous contacts by at least annual chest x-ray examinations, if tuberculin positive, and annual tuberculin test, if initially tuberculin negative.
- (5) Encouragement of the private physician, by every means possible, to utilize the tuberculin test and chest x-ray routinely in the care of the apparently healthy as well as the ill patient.

IV. Treatment of the patient with active tuberculosis must be under continuous medical supervision and should be carried out:
- (1) In a sanatorium, especially during the initial period of treatment or in the infectious stage, or
- (2) In a general acute or chronic disease hospital, if a sanatorium is not available, provided isolation technique during the infectious period is practical, or
- (3) In the home if adequate facilities and competent continuous medical supervision are available, and only when protection of the public health is assured.
- (4) Recognition by the medical profession, through education, that initial therapy of the patient with active tuberculosis remains prolonged and that follow-up treatments and examinations, after the inactive phase has been attained, must be continued for the remainder of the patient's life.
- (5) Rehabiliation, in the broadest sense, remains a necessary part of the treatment of tuberculosis, since additional complications over and beyond the tuberculosis are frequently present. These special problems include alcoholism, silicosis, diabetes, gastrectomies, advanced age, chronic illness, etc.

V. Prophylaxis with chemotherapy should be considered carefully for, (1), children of pre-school age with positive tuberculin reactions, (2), adolescent children and adults with tuberculin conversion within one year, and (3), some patients with appreciable demonstrable inactive tuberculosis under special circumstances, as listed in IV (5).

VI. Education of the public, physicians and other professional groups to understand the documented basic principles of modern tuberculosis control, should be persistent and intensive.

VII. Research, clinical as well as basic, must be continued without restriction.

VIII. The following groups will continue to be involved, cooperatively, in the implementation of the above principles:
- (1) Health Departments.
- (2) Voluntary Tuberculosis Associations.
- (3) Medical Associations.
- (4) Sanatoria.
- (5) Universities and Colleges.
- (6) Welfare Departments.
- (7) Private-Public Hospitals and Private Physicians.
- (8) Auxiliary Professional and Lay Groups.

SUMNER COHEN, M.D.
Pulmonary Committee
Minnesota State Medical Association

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

WHEN YOUR PATIENTS AND THE PUBLIC ASK "WHAT IS THE AMA AND WHAT DOES IT DO?"

Do you tell them that the American Medical Association:

- **is an organization of more than 177,000 doctors who through their county medical societies comprise its membership . . .
- **publishes the weekly *Journal of the American Medical Association,* world's leading medical periodical; the AMA NEWS; ten monthly specialty journals; numerous books, pamphlets, reports . . .
- **provides timely information, through special councils, on such subjects as foods and nutrition, mental health, industrial health, rehabilitation . . .
- **sponsors national meetings at which thousands of physicians exchange ideas and learn "what's newest" in research and medicine . . .

One-fifth of the AMA's annual budget is spent to inform the public about health through such activities as *Today's Health* magazine, a question and answer service, TV and radio programs, films, exhibits, and a research service for news media.

The causes for which the AMA works—and fights—are those lying within its "field of competence": Medicine. They are always in the public interest. Even a partial list indicates their broad range:

- ***Increasing supply of physicians,* by encouraging young people to embark on medical careers, by working with the Association of American Medical Colleges to expand present schools and build new ones.
- ***Better distribution of medical services,* through a physician's placement bureau and an active program to help communities attract qualified medical people.
- ***Better patient care,* by working with other groups to maintain high hospital standards, and by encouraging construction of nursing homes.
- ***Exposing quackery* and alerting public to dangers of food fads, and unproven treatments.
- ***Promotion of voluntary health insurance,* through non-profit and commercial insurance organizations.
- ***Better medical care for the indigent,* through cooperation with state and local governments.
- ***Sound legislation,* such as: funds for hospital and medical school construction, improved pure food and drug laws, hazardous substances control laws, civil defense and medical stockpiling.

What is the Medical Profession Doing to Provide More Doctors for More People?

Do you point out that no group is more aware than the medical profession that more babies born, more years added to the life span and more people looking for more and better medical care will require increased supplies of doctors?

In the past ten years, the AMA—working with the Association of American Medical Colleges—has aided in the establishment of five new medical schools. It is working actively to establish still more, as rapidly as qualified universities can secure facilities and organize staffs.

Established medical schools are being encouraged to expand.

To induce qualified young people to undertake the necessarily long and arduous study of medicine, the AMA:

- **has appointed a special committee to set up an AMA-sponsored scholarship program to help promising medical students.
- **provides such "recruitment" materials as motion pictures, exhibits information literature—for the use of students, faculty advisors, and medical representatives. Many local medical societies are particularly active in medical-career programs, at both high school and college levels.

Since the earliest days of medicine, physicians have recognized their obligation to pass their medical knowledge and skills on to younger men . . . to help each new generation carry medical knowledge on to new frontiers. Physicians are doing this today through their national organization, the AMA, through their local medical societies—and as individuals: *of all the physicians teaching in medical schools, nearly half give their services without pay.* This is in addition to regular monetary contributions to schools by physicians (three million dollars in 1958 alone).

What is the Medical Profession Doing to Help Solve the Health Problems of the Aged?

Do you point out that human beings start aging from the moment they're born. So in their day-to-day practice, physicians become uniquely familiar with the process of aging.

No group is more intimately concerned with those problems than the members of the medical profession. Nor, in all likelihood, has any group devoted more study to the aging process or worked harder to find solutions to the many problems that accompany it.

The one thing that stands out in any study of the aged is that their problems are far broader than those of health alone. The aged have special needs in the field of housing, in recreation, in finding acceptance and understanding within the community, in the effort to be useful, in the preparation for retirement.

What Members of the Medical Profession Are Doing

Sustained progress is now being made under the present system of health care in meeting the complex problems of our 15 million older Americans. The more than 177,000 physicians of the American Medical Association are dedicated to helping maintain that progress and accelerate it.

They have been busy with such programs as these:

1. Finding out the facts on the problems of the aged—through regional conferences and local studies.
2. Campaigning to improve state and local assistance programs for the needy.
3. Leading community drives for construction of additional facilities to care for the aged.
4. Promoting health maintenance programs.
5. Developing rehabilitative services.
6. Pushing such plans as those which permit the sick or older person—or one who is frail—to be cared for at home.
7. Encouraging the increased use of such techniques as progressive patient care in hospitals.
8. Cataloguing the medical and social services available to the aging and making this information known.
9. Looking for ways to make more community facilities available to groups of our older people.

And ever since the American Medical Association was founded, its member physicians have been encouraged to make medical service available to all regardless of ability.

This is the healthiest nation in the world's history. It became the healthiest because the health professions were able to work in freedom; because private citizens, working voluntarily together, shared a sense of responsibility within their communities; and because health insurance was readily available to those who wanted it.

This combination is a proved quantity. It has worked in the past, and it is working now.

The medical profession does not contend that every problem of providing good health care to the aged has been perfectly solved. But it does believe that these problems *can* be solved and *will* be solved and *are being* solved in an effective and orderly fashion.

Minnesota Blue Shield

Minnesota Blue Shield opened enrollment in its Senior Citizen Plan during the month of October, offering medical-surgical coverage for persons 65 and over, Dr. Richard R. Cranmer, executive director of the medical-care plan, announced.

The last previous enrollment period was held from May 2 through June 30, 1960.

At a cost of $2.95 per month, benefits for 120 days of in-hospital medical care are provided under the Senior Citizen Plan, as well as the full range of Blue Shield surgical coverage. Electroshock therapy, X-ray treatment for specific conditions and certain anesthesia services and endoscopic examinations are also included.

The contract also provides coverage for diagnostic X-ray and laboratory services, whether performed in the doctor's office, patient's home, or the out-patient department of the hospital.

Dr. Cranmer expressed the hope that participating doctors will assume "an active role in bringing the benefits of the Senior Citizen Plan to the attention of patients who are over 65."

"It is particularly important to do so at this time," he continued. "We have already seen government entry into this field and we can expect increased efforts at the next congressional session to broaden the scope of this coverage.

"It is, therefore, important," Dr. Cranmer added, "that those who believe in the voluntary prepayment philosophy should strongly support the Blue Shield plan for senior citizens of this state."

Dr. Cranmer said participating physicians will receive application blanks for the Senior Citizen Plan and said he hoped they would display these in their waiting rooms, as so many did during the last enrollment period.

Members of the Minnesota State Pharmaceutical Association will again make applications available in drug stores throughout the state, as they also did during the May-June enrollment.

Advertising messages will stress the fact that applications may be obtained at doctors' offices or drug stores.

Endorsement of Minnesota Blue Shield by doctors to their patients has, over the years, proven one of the most effective means of expanding Blue Shield coverage throughout the community.

The doctor's effectiveness in this regard is due to the position of respect and authority which he enjoys in his dealings with patients, as well as the frequent opportunities presented him for discussing a health care plan with them.

It is important, therefore, that doctors take advantage of their position to point out the superior features of the Minnesota Blue Shield program.

In doing so, they will help maintain the community-wide coverage which has been a fundamental part of the Blue Shield philosophy, that of offering broad coverage to as many citizens as possible, the old and the young, the sick and the healthy. This is the philosophy which sets Blue Shield apart from private insurance plans.

The contribution by doctors toward the expansion of Blue Shield in their communities was vividly demonstrated during the recent enrollment period for Minnesota Blue Shield's Senior Citizens Plan. Application blanks for this plan were displayed in an attractive holder in doctors' offices, as well as in drug stores, and the response from these applications was most satisfactory.

This offering of the Senior Citizens Plan applications in doctors' offices also helped to emphasize the medical profession's participation in Blue Shield, as the plan "your doctor recommends."

Following the successful distribution of these forms through doctors' offices, applications for the Minnesota Blue Shield standard non-group contracts for those under 65 are being sent to doctors for convenient display in the same holder.

In addition, an attractive easel-back display poster, reminding patients to "Be Sure It's Blue Shield . . . Ask Your Family Doctor" is being sent each participating doctor for placing in his waiting room.

Besides these specific types of endorsement, doctors often have opportunities for discussing the Blue Shield plans before various groups in their city or town. They often have, in the past, been generous with their time in making such appearances before groups.

In continuing to do so, they make a valuable contribution to the health economy of their areas and help reaffirm the principle that voluntary health plans are a far better solution to the problem of health care coverage than any government-administered method.

Minnesota Blue Shield headquarters will gladly assist any doctor in these presentations by supplying him with data and background information for his use.

The value of these personal presentations by doctors need hardly be stressed. Just as the medical profession's courageous establishment of the Blue Shield idea twenty years ago met the challenges of the time, so also today the continued support of the Blue Shield program by participating doctors is by far the strongest bulwark against pressures for government controlled health insurance.

Prepaid medical care is a proven, workable idea and is definitely here to stay. Also, it will remain on a voluntary basis if the public fully understands the advantages of this type of coverage over tax-paid, government intervention in this field.

Blood pressure that goes up with stress often comes down with SERPASIL®

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One reason that many cases of hypertension respond to Serpasil is that many cases are associated with stress. Stress situations produce stimuli which pass through the sympathetic nerves, constricting blood vessels, and increasing heart rate. Hyperactivity of the sympathetic nervous system may elevate blood pressure; if prolonged, this may produce frank hypertension. By blocking the flow of excessive stimuli to the sympathetic nervous system, Serpasil guards against stress-induced vasoconstriction, brings blood pressure down slowly and gently.

In mild to moderate hypertension, Serpasil is basic therapy, effective alone "... in about 70 per cent of cases..."*

In severe hypertension, Serpasil is valuable as a primer. By adjusting the patient to the physiologic setting of lower pressure, it smooths the way for more potent antihypertensives.

In all grades of hypertension, Serpasil may be used as a background agent. By permitting lower dosage of more potent antihypertensives, Serpasil minimizes the incidence and severity of their side effects.

CIBA
SUMMIT, N. J.

*Coan, J. P., McAlpine, J. C., and Boone, J. A.: J. South Carolina M. A. 51:417 (Dec.) 1955. /2830M8

Complete information available on request.



In Memoriam

HENDRIE W. GRANT

Dr. Hendrie W. Grant, St. Paul physician and surgeon for forty years, died August 5, 1960. He was sixty-six years of age at the time of his death.

Doctor Grant was born in Maine, where he attended the Calais High School. He graduated from Bowdoin College and Medical School at Brunswick, Maine, in 1920. He established a practice in St. Paul in 1920, continuing his graduate studies in ophthalmology at the University of Minnesota until 1923. He studied in Vienna in 1925 and 1926.

For twenty-five years, Doctor Grant had been a member of the staff at the University of Minnesota Medical School. He was also a staff member at Miller and University Hospitals. He served with the U. S. Army during World War I.

Doctor Grant was a member of the Ramsey County Medical Society; Minnesota State Medical Association; American Medical Association; Minnesota Academy of Ophthalmology, and Pan American Society.

He is survived by his wife, Elizabeth; a son, Hendrie J.; a daughter, Elizabeth Thorne, all of St. Paul.

FORDYCE RUSSELL HEILMAN

Dr. Fordyce R. Heilman, Mayo Clinic, died August 16, 1960. He was fifty-five years of age at the time of his death.

Doctor Heilman was born in Austin, Minnesota, June 16, 1905, and attended the elementary schools in Austin and Fargo, North Dakota. In 1923, he became a student in the North Dakota Agricultural College. He remained there until 1926, when he went to Northwestern University, where he obtained the degree of Bachelor of Science in 1930 and that of Doctor of Medicine in 1931.

He came to Rochester on July 1, 1932, as a fellow in surgery of the Mayo Foundation. On April 1, 1935, he was appointed a first assistant in experimental bacteriology in the Mayo Foundation, and in 1938 he received the degree of Master of Science in bacteriology from the University of Minnesota.

Doctor Heilman was appointed to the staff of the Mayo Clinic in 1939, as a consultant in the Section of Bacteriology. He became head of this section on October 1, 1944.

Doctor Heilman was appointed an instructor in bacteriology in the Mayo Foundation, Graduate School in 1939 and was advanced to assistant professor in 1941, associate professor in 1945, and professor in 1946.

He was made a charter fellow of the American Academy of Microbiology in 1957 in recognition of his position as "distinguished in the field of microbiology, with wide training and experience."

Doctor Heilman was a fellow of the American Medical Association and the American Public Health Association, a member of the Zumbro Valley Medical Society, Minnesota State Medical Association, American Medical Association, Society of American Bacteriologists, American Association for the Advancement of Science, American Society of Clinical Pathologists, American Association for Cancer Research, Society for Experimental Biology and Medicine, Society for General Microbiology, New York Academy of Sciences, Society of Sigma Xi, Alpha Omega Alpha honor society, and Phi Rho Sigma professional medical fraternity.

Survivors include a brother, Dr. Charles Heilman, Fargo, North Dakota; and a sister, Mrs. R. G. Brakke, Moorhead, Minnesota.

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Dosage: One tablet one-half to one hour before each meal.

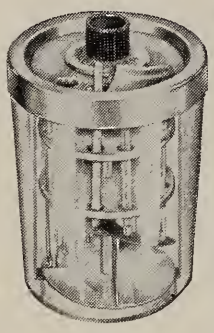
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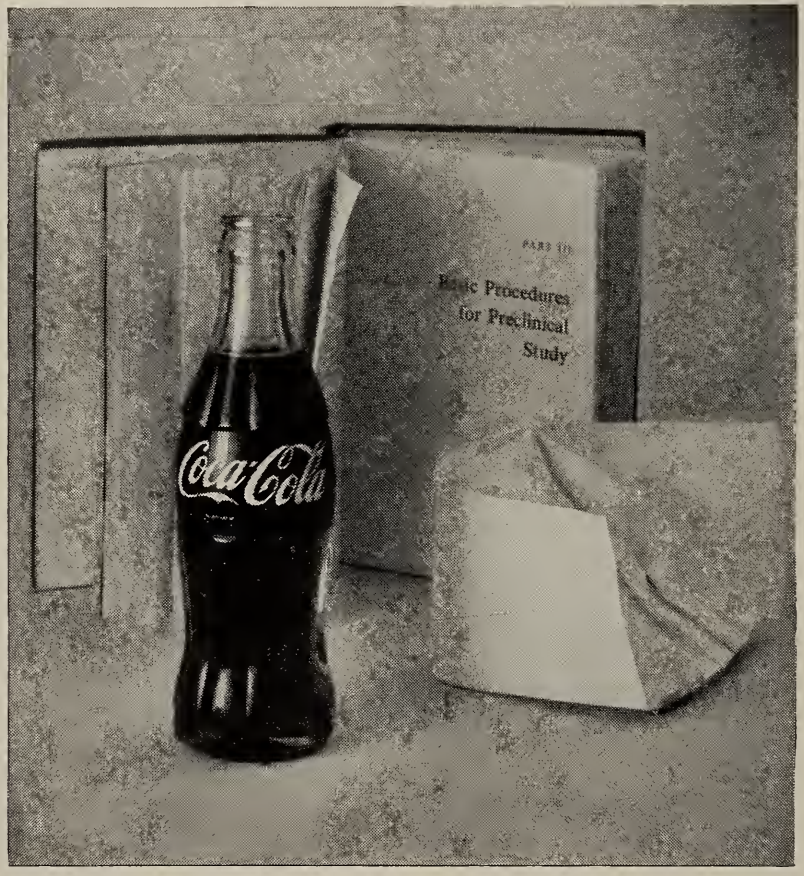
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meprobamate **plus** d-amphetamine... depresses appetite...elevates mood... eases tensions of dieting...**without** overstimulation, insomnia or barbiturate hangover.

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When too many tasks
seem to crowd
the unyielding hours,
a welcome
"pause that refreshes"
with ice-cold Coca-Cola
often puts things
into manageable order.

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The Physician's Diary

Dr. E. A. Kilbride, Worthington, recently resumed his practice of medicine in that city. Doctor Kilbride had been recuperating from surgery since February, 1959.

* * *

Dr. R. D. Hanover and **Dr. C. B. Will** have announced the addition of **Dr. George M. Crow** to their practice of medicine in International Falls. Doctor Crow was recently discharged from army service.

* * *

A former fellow in Otolaryngology and Rhinology in the Mayo Foundation has left that position to open a practice in Minneapolis, Minnesota. **Dr. Joseph W. Teynor** left Rochester in July.

* * *

A partner of the New London Clinic, **Dr. Wendell Ford**, left September 1 with his family for Hermiston, Oregon. As yet, no physician has been engaged to fill Doctor Ford's position at the Clinic.

* * *

On September 15, 1960, **Dr. Charles W. Mayo**, Rochester, received the 1960 Minnesota Distinguished Citizen Award given annually by the Minnesota Chapter of the Public Relations Society of America. Doctor Mayo's selection was based mainly on the contribution he has made to Minnesota in activities outside his regular profession.

* * *

The St. Luke's Hospital Educational Memorial Foundation of Duluth sponsored its second Medical Education Day recently. On the faculty for the day were **Dr. Arnold Kremen**, Minneapolis; **Dr. Claude Hitchcock**, Minneapolis; **Dr. George W. Janda**, Minneapolis; and **Dr. Donald Lannin**, Minneapolis. The program included discussions in nine specialty fields and a panel discussion on "New Concepts in Cancer Therapy."

* * *

Dr. Edward M. Litin was a guest speaker at the annual meeting of the West Virginia State Medical Association held at the Greenbrier Hotel, White Sulphur Springs, West Virginia. Doctor Litin spoke on "Problems of Adolescence" and "Emotional Aspects of Physical Handicaps."

* * *

St. Mary's Hospital, Minneapolis, Minnesota, has received approval from the Residency Review Committee for a three-year residency in obstetrics and gynecology. **Dr. Leonard Lang** is Chief of the Service and **Dr. Richard L. Jackson**, Director of Residency Training in Obstetrics and Gynecology.

* * *

Physicians of the Warren Clinic, **Dr. C. H. Holmstrom** and **Dr. E. E. Pumala**, have moved into their new clinic building constructed on the corner of Main Street and Park Avenue in Warren. The building is equipped to take care of five doctors in addition to clinical laboratories, x-ray and other necessary appurtenances.

* * *

Dr. E. O. Thorsgaard, Thief River Falls, was elected president of the Northwestern Hospital Medical Staff for 1960-61 at an organizational meeting at the Hospital. Doctor Thorsgaard, vice president of the group last year, succeeds **Dr. H. N. Boroson** who was elected Secretary-Treasurer. Vice President of the staff for the coming year will be **Dr. M. A. Mochal.**

* * *

Dr. Charles Vandersluis, formerly of Warren, has opened his own practice of medicine in Minneota. No replacement has been secured as yet for his position in Warren.

* * *

Rochester physician, **Dr. L. B. Woolner** and his family, have returned from an eight-week trip to Europe. Doctor Woolner attended the Fourth International Goiter Congress and the International Academy of Pathology both in London.

* * *

The Stoughton Avenue Clinic in Chaska has announced the appointment of **Dr. Gerald Nelson** as an associate of **Dr. G. T. Schimelpfenig** in the practice of medicine. Doctor Nelson is a graduate of the University of Minnesota.

* * *

Dr. Gershom Thompson, head of the Section of Urology at the Mayo Clinic, took over the presidency of the U. S. Section of the International College of Surgeons at the group's annual meeting in Winnipeg, Canada, on September 28 and 29. Dr. Thompson, elected to the post recently, replaced Dr. Edward L. Compere of Chicago. His term is for one year.

* * *

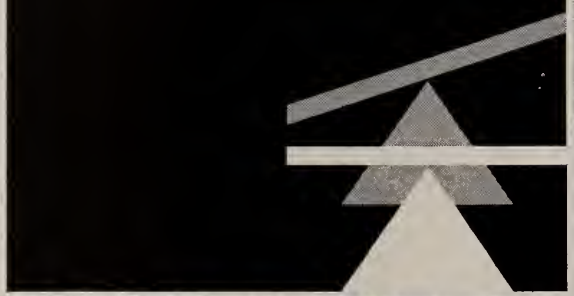
Dr. W. D. Brown, Jr., Minneapolis, has joined the practice of medicine with his father, **Dr. W. D. Brown, Sr.** Dr. Brown, Jr., makes the third generation of the Brown family who have practiced the profession of medicine.

* * *

The French National Society of Physical Medicine has elected **Dr. Frank H. Krusen**, Rochester, as an honorary member of the group. Doctor Krusen has served as president of every major national and international organization devoted to his special field of medicine. Doctor Krusen served as president of the Third International Congress of Physical Medicine and Rehabilitation at Washington, D. C.

in rheumatic disorders

whenever aspirin proves inadequate



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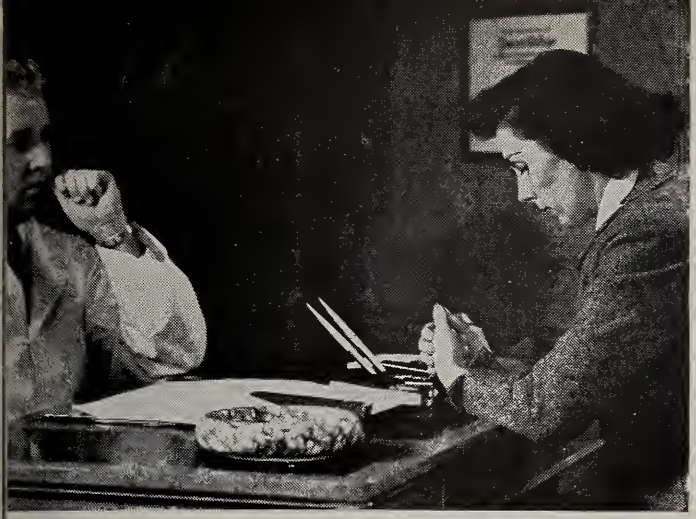
Even in the more transient rheumatic disorders, an anti-inflammatory effect more potent than that provided by aspirin is often desirable to hasten recovery and get the patient back to work.
By combining the anti-inflammatory action of prednisone and phenylbutazone, Sterazolidin brings about exceptionally rapid resolution of inflammation with relief of symptoms and restoration of function.
Since Sterazolidin is effective in low dosage, the possibility of significant hypercortisonism, even in long-term therapy, is substantially reduced.

Availability: Each Sterazolidin® capsule contains prednisone 1.25 mg.; Butazolidin®, brand of phenylbutazone, 50 mg.; dried aluminum hydroxide gel 100 mg.; magnesium trisilicate 150 mg.; and homatropine methylbromide 1.25 mg. Bottles of 100 capsules.

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The physician listens to a tense, nervous patient discuss her emotional problems. To help her, he prescribes Meprospan® (400 mg.), the only continuous-release form of meprobamate.



The patient takes one Meprospan-400 capsule at breakfast. She has been suffering from recurring states of anxiety which have no organic etiology.



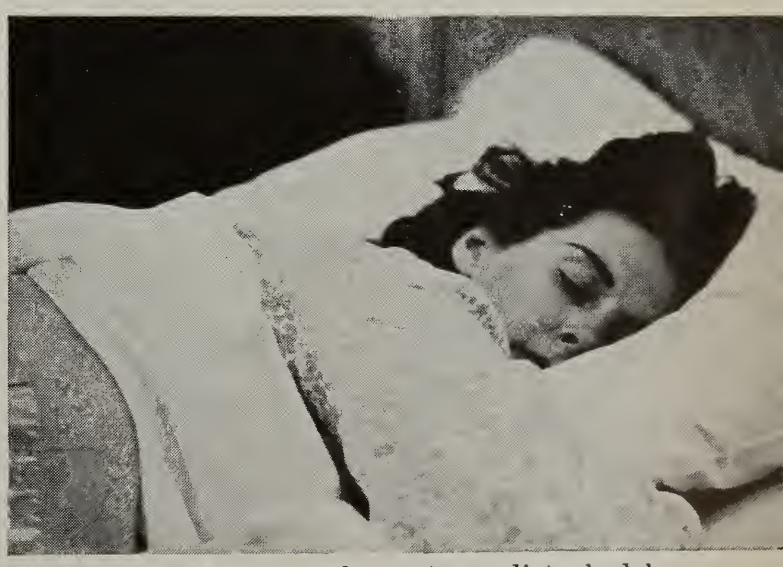
She stays calm while on Meprospan, even under the pressure of busy, crowded supermarket shopping. And she is not likely to experience any autonomic side reactions, sleepiness or other discomfort.



She takes another capsule of Meprospan-400 with her evening meal. She has enjoyed sustained tranquilization all day—and has had no between-dose letdowns. Now she can enjoy sustained tranquilization all through the night.



Relaxed, alert, attentive . . . she is able to listen carefully to P.T.A. proposals. For Meprospan does not affect either her mental or her physical efficiency.



Peacefully asleep . . . she rests, undisturbed by nervousness or tension. (Samples and literature on Meprospan available from Wallace Laboratories, Cranbury, N. J.)

Dr. Edwin Tanquist, Jr., has joined his father **Dr. E. J. Tanquist** in the practice of medicine in Alexandria. Dr. Tanquist, Jr., formerly practiced in Panama. He is a graduate of the University of Minnesota.

* * *

The Pine County Board of Commissioners has appointed **Dr. E. G. Hubin,** Sandstone, to the post of Pine County Coroner.

* * *

Among doctors participating in the program of the Third International Congress of Physical Medicine in Washington, D.C., were **Dr. Frederick J. Kottke,** Minneapolis; **Dr. Earl C. Elkins,** Mayo Clinic; **Dr. Miland E. Knapp,** Minneapolis; and **Dr. Paul M. Ellwood, Jr.,** Minneapolis.

* * *

"Electroencephalography in Anesthesiology" was published by Charles C Thomas recently. One of the authors is **Dr. Albert Faulconer, Jr.,** head of the Section of Anesthesiology at the Mayo Clinic. The book deals with the application of what is learned from measurements and recordings of the electrical energy of the brain to the state of anesthesia.

* * *

Former Evansville physician, **Dr. Erling Ostergaard,** has moved to Chinle, Arizona. He will work with the Indians at the Rock Point Mission there.

* * *

The August 8 issue of the *Tyler Journal* carried an editorial devoted to the fiftieth anniversary of **Dr. A. L. Vadheim's** medical practice in that community and surrounding area. The people of Tyler and area sponsored a special Dr. A. L. Vadheim appreciation day on August 10, 1953, in recognition of his forty-three years of service. Doctor Vadheim now resides in Brookings, S. D.

* * *

Harmony, Minnesota, has a new physician. He is **Dr. Albert A. Bodaski,** formerly of Tyler, Minnesota. where he had practiced medicine for the past eight years. Prior to his stay in Tyler, Doctor Bodaski practiced in Montgomery, Minnesota. He is a graduate of the University of Minnesota.

* * *

Dr. E. J. Huenekens, vice president of the Minneapolis Welfare Board, has submitted his resignation. He was a member of the Board of Welfare for fifteen years.

* * *

Appointment of **Dr. E. C. Clark,** Mayo Clinic, to the Board of Public Health and Welfare of Rochester has

adult stable diabetics and a significant number of sulfonylurea failures respond to

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adult stable diabetes

"In our experience the action of DBI on the adult stable type of diabetes is impressive . . . **88% were well controlled by DBI."**[1]

"Most mild diabetic patients were well controlled on a biguanide compound [DBI], and such control was occasionally superior to that of insulin. This was true regardless of age, duration of diabetes, or response to tolbutamide."[2]

"DBI has been able to replace insulin or other hypoglycemic agents with desirable regulation of the diabetes when it is used in conjunction with diet in the management of adult and otherwise stable diabetes."[3]

sulfonylurea failures

Among those diabetics who responded to tolbutamide initially and became secondary failures **DBI "gave a satisfactory response in 55%."**[4]

"DBI is capable of restoring control in a considerable portion of patients in whom sulfonylurea compounds have failed, either primarily or secondarily."[5]

"All twelve secondary tolbutamide failures have done well on DBI."[6]

"34 out of 59 sulfonylurea primary failures were successfully treated with DBI."[7]



been announced. It was also announced that the Mayor is ready to appoint another physician to the Board when such action becomes authorized by ordinance.

* * *

Dr. N. E. A. Leppo, Duluth pediatrician, recently returned from a three-week trip to South America to attend the fiftieth anniversary meeting of the Brazilian Pediatric Society in Rio de Janeiro and the Pan American Pediatric Congress in Caracas, Venezuela. He also visited his brother who is the Finnish Ambassador in Argentina.

* * *

Chaska and the surrounding area now have the services of an additional physician. **Dr. Patrick J. Adams** is now an associate of **Dr. C. R. Heinzerling.** Doctor Adams is a graduate of Loyola University in Chicago.

* * *

Dr. Robert R. Kundel, formerly of Ely, has accepted a radiology residency with the Veterans Administration Hospital and the University of Minnesota in Minneapolis. The residency rotates among Veterans Administration, University, Minneapolis General, and Ancker Hospitals.

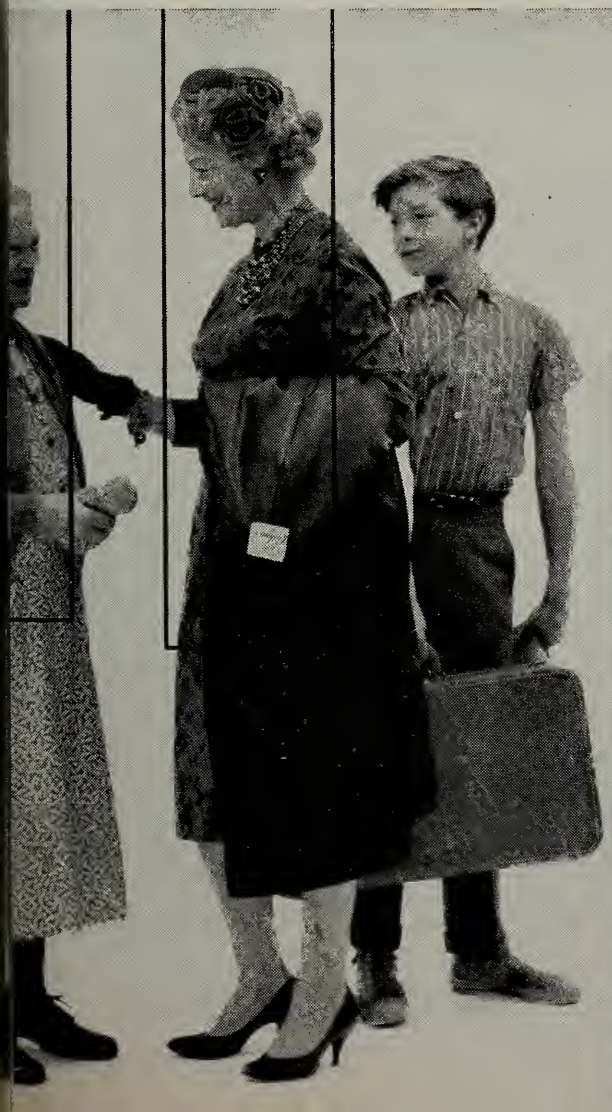
Dr. Gordon R. Kamman, St. Paul, attended a staff meeting of the Bangkok Sanitarium and Hospital in Bangkok, Thailand, on August 23. While in Bangkok, Dr. Kamman met and visited with **Dr. Tom Dooley** who, because of the unsettled conditions in Laos, came over to Bangkok.

* * *

Among those honored at the First Awards Convocation at the Mayo Foundation were **Dr. Juergen E. Thomas,** Mayo Clinic, winner of the Edward John Noble Foundation Award, for the display and development of leadership; and **Dr. Louis A. Buie, Jr.,** Mayo Clinic, recipient of the Howard K. Gray Travel Award for 1961.

* * *

Dr. Earl E. Christenson, the fourth recipient of the Rural Medical Scholarship sponsored annually by the Minnesota State Medical Association, began his practice of medicine in Clinton, Minnesota, on July 5, following the completion of his internship at Bethesda Hospital in St. Paul.



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(N^1-β-phenethylbiguanide) is available as white, scored tablets of 25 mg. each, bottles of 100.

Send for brochure with complete dosage instructions for each class of diabetes, and other pertinent information.

1. Walker, R. S.: Brit. M. J. 2:405, 1959.
2. Odell, W. D., et al.: A.M.A. Arch. Int. Med. 102:520, 1958.
3. Pearlman, W.: Phenformin Symposium, Houston, Feb. 1959.
4. DeLawter, D. E., et al.: J.A.M.A. 171:1786 (Nov. 28) 1959.
5. McKendry, J. B., et al.: Canad. M. A. J. 80:773, 1959.
6. Miller, E. C.: Phenformin Symposium, Houston, Feb. 1959.
7. Krall, L. P.: Applied Therapeutics 2:137, 1960.

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satisfies hunger—QUOTA is a high-satiety food; patients may be allowed to eat celery, radishes, green pepper and similar low-calorie "snacks" at mealtime or between meals, if they wish.

EASY TO PREPARE—Patient simply mixes contents of QUOTA can with 1 qt. of water in a shaker or bowl

A WHOLE DAY'S SUPPLY may be made at once and stored in covered container in refrigerator



*Recommended Dietary Allowance established by the National Research Council, Publication 589, National Academy of Sciences, Washington, D.C., 1958.

DOCTORS CHARGED WITH LOWER HOSPITAL COST RESPONSIBILITY

A study committee appointed by the New Jersey Commissioner of Insurance to investigate the rising costs of Blue Cross rates in that state, has placed the responsibility for reducing the cost of hospital care directly on the doctor.

The Committee, in its final report, presented the following analysis of New Jersey hospital charges from 1953 to 1958.

"Hotel" costs—food, housekeeping, personnel and administration—accounted for a 7.8 per cent increase in the total per diem cost. During the same period, medical care costs—including laboratory procedures, house staff and nurses' salaries, drugs and equipment—accounted for a 24.6 per cent increase. In addition, there was a utilization rate increase of 12.1 per cent.

Doctors Select Services

"The major cost increases have been in the area of medical and professional care", the Committee stated. It was noted that physicians admit patients to the hospital, determine how long they should stay, decide what services must be available, and the extent of their use. Therefore, the Committee said, it is "amplifying the call to the medical profession for cooperation in attempting to cut Blue Cross rises."

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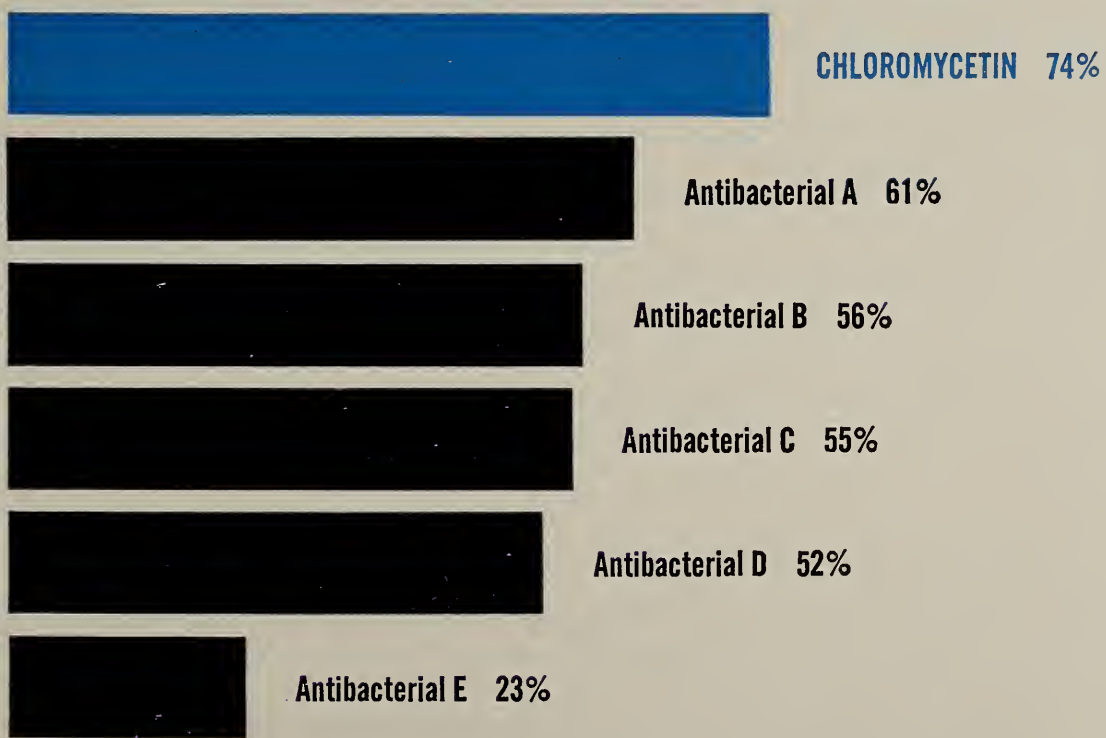
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The Influence of Ethanol on Serum Cholesterol Concentration

FRANCISCO GRANDE
DONALD S. AMATUZIO
Minneapolis, Minnesota

BECAUSE of the correlation between serum cholesterol concentration and incidence of coronary infarction[1,2] there is great interest in studying the factors affecting the cholesterol levels. There is good evidence at the present[3-5] that the diet, and particularly the amount and kind of dietary fat, has a significant influence on serum cholesterol level in man. Other dietary components may have also some effect upon serum cholesterol concentration, as indicated by experiments in animals, but the changes in blood lipids are produced only under such extreme dietary changes that it is doubtful that the results are relevant to explain the cholesterol differences between men subsisting on the usual human diets. Experiments in man have shown[6] that changes in the nature of dietary carbohydrates produces significant but small changes of serum cholesterol concentration.

In spite of the fact that alcohol is so widely used, only limited attention has been given to the study of its effects on serum cholesterol concentration. The old concept that arteriosclerosis is a direct outcome of excessive alcohol intake is not supported by the more recent experience. In fact the autopsy data from alcoholic persons indicate that heavy alcoholics are remarkably free from atherosclerosis, and some observations have been interpreted as showing that alcohol has a protective effect in decreasing the development of atherosclerotic lesions[7,8]. The autopsy data, however, are controversial and other explanations are possible. Wilens,[9] noting the dietary intake of alcoholics, concluded that alcohol itself does not protect the arterial system from the development of atherosclerosic lesions; and the relative absence of atherosclerosis in the alcohol subjects could be explained by their decreased food intake.

From the Jay Phillips Research Laboratory, Mount Sinai Hospital, and the Departments of Physiological Hygiene and Medicine of the University of Minnesota, Minneapolis, Minnesota. Supported by Grants from the John A. Hartford Foundation, the Mount Sinai Hospital Research Fund, and the Minnesota Heart Association.

On the other hand Kimura[10] has recently reported that marked atherosclerosis is more frequently found in the autopsies of men who habitually drank and smoked cigarettes than in autopsies of men who indulged in neither. Gertler and his collaborators,[11] in a study of young victims of coronary infarction, concluded that they had a lower alcohol intake but had used more concentrated alcohol beverages than a control group of healthy men. Spain and Bradess[12] reported on a group of chronic alcoholics in which 7 per cent of the men died of coronary occlusion. The male chronic alcoholics of their group died at the same age as the rest of the population. Alcoholism in itself did not appear to accelerate or prevent the atherogenic process in this study. Finally Jankelson and his associates[13] have observed that atherosclerosis is not less frequent among chronic alcoholics than among non-alcoholic men of comparable age.

Little attention has been given in the past to the effects of alcohol on serum cholesterol concentration in man. Hobson and his group,[14] in a study on elderly people, have reported that the average serum cholesterol concentration in heavy drinkers is lower than that of abstainers or moderate drinkers. These observations, however, do not agree with the older observation by Ducceschi and Barilari[15] who found higher cholesterol values in habitual drinkers of alcoholic beverages than in all abstainers of comparable age. The recent studies by Jankelson et al,[13] show no difference in serum cholesterol concentration between chronic alcoholics and non-alcoholics.

Experimental work in animals has given conflicting results. In 1914 Ducceschi[16] reported an increase of serum cholesterol concentration in dogs given high doses of alcohol for a few days. Eberhard (1936) found that administration of alcohol increases serum cholesterol levels and reduces the amount of lipid deposited in the arteries of the rabbit.[17] These observations, however, were not confirmed by Feller and Huff.[18] Morgan and his co-workers have found that the increase in serum cholesterol of female hamsters on a cholesterol-containing diet was greater in the animals drinking water than in the animals given wine.[19] In contrast, Gottlieb and his collaborators[20] published an extensive study of the effects of ethanol on serum cholesterol concentration in the rat. It was found that administration of 20 per cent ethanol to rats on a diet containing 1 per cent cholesterol and 0.3 per cent of cholic acid resulted in higher serum cholesterol levels than those observed in rats on the same diet, without alcohol. The animals receiving alcohol also showed a more extensive vascular sudanophilia than the rats fed the atherogenic diet with water. When the ethanol was given to rats receiving a diet free of cholesterol and of cholic acid, the serum cholesterol level was slightly higher than in the animals on the same diet with water.

The effect of alcohol ingestion on serum cholesterol concentration and development of experimental athersclerosis in chicken has been studied recently by Nikkila and Ollila.[21] Cockerels fed different diets showed significantly higher serum cholesterol and phospholipids when 7 per cent ethanol was given as drinking fluid, than control animals on the same diets but drinking water. No protective effect of alcohol against the atherosclerosis-inducing power of hypercholesterolemia was found in these experiments.

From the preceding review of the literature it is clear that more information is required to establish the influence of alcohol on serum cholesterol concentration, and its possible influence on the development of the atherosclerotic lesions. In this laboratory we have been interested in the study of the effect of ethanol on serum cholesterol concentration as a result of the observation by Amatuzio and Hay in 1958,[22] that alcohol increases the concentration of cholesterol and other serum lipids in hyperlipemic individuals. Accordingly, controlled dietary experiments were made in dogs and normal men[23,24] in an attempt to establish the effect of ethanol administration on the concentration of serum cholesterol. The results of these experiments show that alcohol increases serum cholesterol concentration in the dog and in man, but that the effect in man is less marked than in the dog.

The Effect of Ethanol on Serum Cholesterol Concentration in Dogs.—Normal male dogs were used in these experiments. The animals were fed a basic low-fat commercial dog food of low cholesterol content (18 mg. of Lieberman Burchard reacting material per 100 g.). This diet was mixed with fat to make the proportion of fat calories up to 40 per cent of the total. The animals were fed at libitum, and their weight

was determined each week. Alcohol was administered daily by stomach tube at the amount of 1.65 g. of ethanol per kg. of body weight (1 ml. of 95 per cent alcohol per pound of body weight). The experiments were done following a switch-back reversal design. Alcohol was given to only half of the dogs during the first two-week period and to the other half during the second period. The duration of the experimental periods was two weeks. The details of the methods used have been described elsewhere.[24]

Administration of alcohol at the amount of 1.65 g./kg. per day produced in all the dogs a significant increase of serum cholesterol concentration which reached a maximum after two weeks of treatment. The increase of serum cholesterol concentration was also studied in dogs subsiding on the low fat diet (4 per cent of fat calories) and in dogs subsisting on high fat diets (40 per cent of fat calories). The fats used for supplementing the diet were either lard or sunflower oil.

The results of three groups of experiments are summarized in Table I.

It is evident that administration of ethanol produced a significant increase of serum cholesterol concentration after two weeks of daily administration. The increase observed in the animals receiving the high-fat diets appears to be higher than that observed in the animals on the low-fat diet. However, statistical analysis of an experiment comparing the same animals on both the low and the high-fat diet showed that the difference is not statistically significant. No significant difference exists between the responses to ethanol observed on the high-fat diets of either lard (low in poly-unsaturated fatty acids) or sunflower oil (rich in poly-unsaturated fatty acids). It should be noticed that the effects of dietary fat and alcohol on serum cholesterol concentration in the dog are additive. An increase of serum cholesterol was observed when the dogs were changed from a low-fat diet to a high-fat diet, and a greater increase was produced when the alcohol was given with the high-fat diet.

On discontinuing the administration of alcohol, the serum cholesterol concentration decreased and reached the pre-alcohol level in about two weeks. On the other hand if the alcohol administration continues, the serum cholesterol concentration is maintained approximately at the same level as observed at the end of the first two weeks of alcohol administration. Dogs maintained in this laboratory for several months with daily administration of alcohol and high fat diet (lard) continued to show the same high levels of serum cholesterol as observed at the end of the initial two-week period.

The cholesterol response to ethanol administration is again observed if a second period of alcohol administration is started after weeks or months without alcohol. An experiment done with a group of five dogs showed that the cholesterol response to ethanol after a period of several weeks without alcohol was statistically not different from that observed after the first alcohol administration.

Experiments in this laboratory have shown that the elevation of serum cholesterol produced in the dog by ethanol cannot be prevented by administration of nicotinic acid.[25] In fact the cholesterol increase produced in six dogs by the administration of 1.65 g. of ethanol/kg. per day for two weeks, was statistically not different from the increase observed in the same dogs when the alcohol was administered when the animals were receiving 1.2 g. of nicotinic acid per day (mean weight of the dogs 17.5 kg.).

THE EFFECT OF ETHANOL (1.65 g./kg./day, FOR TWO WEEKS) ON SERUM CHOLESTROL CONCENTRATION IN THE DOG

Exp.	No. of Dogs	Diet	Serum Total, Cholesterol, mg./100 ml. No Alcohol	Alcohol	Difference	P
I	8	Low Fat	136±11.7	188±14.8	52±8.2	=0.0004
II	24	High Fat (lard)	200± 9.5	275±10.8	75±6.6	<0.0001
III	6	High Fat (Sunflower oil)	192±17.6	281±19.7	89±6.0	<0.0001

Values are means and Standard errors of the means.

TABLE I.

The Effect of Ethanol on Serum Cholesterol Concentration in Normal Men.—Two experiments were performed on normal men—inmates in the Minnesota State Prison in Stillwater, Minnesota. These men subsisted on a normal diet containing approximately 38 per cent of fat calories. The technical details have been described elsewhere.[24] Fifty-nine men participated in the first experiment in which 3 ounces of 100-proof whiskey were given per day. The effect of the whiskey was compared with that of an isocaloric amount of syrup. A switch-back design was followed: half of the men received the whiskey for a period of three weeks while the rest of the men received the syrup supplement. After three weeks the treatments were reversed. Body weight determined weekly was constant. No significance differences were observed at the end of three weeks, between the cholesterol levels on alcohol and on syrup.

A second experiment with a larger daily alcoholic intake was performed with a group of fourteen men. Seven men received for three weeks a daily supplement of 9 ounces of 100-proof whiskey divided into three doses of 2, 3, and 4 ounces, respectively. The other seven men were given instead an isocaloric amount of syrup and the experimental reverse type design was followed as in the previous experiment. A small but statistically significant increase of serum cholesterol concentration (18 mg./100 ml.) was observed in this experiment, which indicates that this high amount of alcohol produces an elevation of serum cholesterol in man. However, it is less pronounced than that observed in the dog. The amount of ethanol ingested by the fourteen men in this experiment was on the average 1.36 g./kg. per day.

Analysis of the cholesterol changes observed in this experiment indicates a significant correlation between the response to ethanol and the initial serum cholesterol level of the subjects. The men having higher serum cholesterol concentration during the control period showed also a greater cholesterol increase with the administration of alcohol.

The Effect of Ethanol on Serum Cholesterol in Hyperlipemic Men.—Studies made in this laboratory[22] have shown that the fasting serum of patients with essential hyperlipemia, becomes clear with a decrease of the concentration of the different lipid fractions, when dairy foods are eliminated from their diets. This effect failed to be produced in some of the subjects who habitually ingested a moderate amount of alcoholic beverages. A systematic study of the serum lipids of these patients demonstrated that the serum became clear when the alcohol ingestion was discontinued. The addition of alcohol at the dose of ½ to 3 oz. of ethanol per day for one to three weeks while subsisting on an isocaloric diet devoid of dairy fats produced turbidity of the fasting serum with increase of the concentrations of cholesterol, total esterified fatty acids, and lipid phosphorus.

Comment

The experiments which have been summarized show that ethyl alcohol produces a very marked effect on serum cholesterol concentration in the dog. Our findings agree with the older data published by Ducceschi[16] and seem to indicate that the dog is particularly sensitive to the effect of alcohol in this respect. This fact adds an interesting data to our knowledge about the differences in lipid metabolism between different animal species.

Other authors have found increases of serum cholesterol in animals after administration of ethanol, but most of the experiments have been done while the animals were receiving diets of high cholesterol content and added with bile acids. The study by Gottlieb et al[20] is important in this respect in showing that the response of the rat's serum cholesterol to ethanol is much greater when the animal has been made hypercholesterolemic by administration of cholesterol and bile acids, than when the animal was kept on a diet devoid of cholesterol and bile acids.

There is no explanation at the present for this effect of ethanol. Ducceschi[16] stated that the effect of alcohol on serum cholesterol concentration was related to its narcotic effects but experiments performed in this laboratory with administration of the ethanol in divided doses, in order to prevent the narcotic effect, have shown that the cholesterol response is essentially the same than when the ethanol is administered in a single dose.[24]

It is known that ethanol is oxidized in the body to acetic acid and that acetic acid can be used as a precursor of cholesterol.[26,27] However, administration of acetate at a dose corresponding to the amount of ethanol given to the dogs, failed to produce any change of serum cholesterol concentration.[24]

Nikkila and Ollila[21] suggested that the effect of the alcohol may be related to the pyridine nucleo-

tides which participate in the enzyme systems involved in the synthesis of cholesterol and fatty acids and in the enzyme systems responsible for the metabolism of ethanol. This possibility, however, is not supported by our experiments with nicotinic acid and ethanol in the dog, which showed that the administration of a large dose of nicotinic acid fails to modify the effect of alcohol on serum cholesterol concentration in this animal.[25]

The effect of ethanol on the serum cholesterol concentration in normal man is certainly small, and high doses of ethanol are needed to produce an elevation of serum cholesterol which reaches statistical significance. However, the fact that such an increase is produced indicates that alcohol may be of some importance in maintaining high levels of serum cholesterol in individuals drinking large amounts of alcoholic beverages and subsisting on high-fat diets.

The fact that ethanol increases serum cholesterol (and other lipids) concentration in the serum of hyperlipemic individuals is important from the medical viewpoint and indicates that these patients should be advised against drinking alcoholic beverages. The same is true of essential hyperlipemic individuals and in subjects with high intrinsic cholesterol levels.[22,24] The results of our experiments in men indicate that these individuals should avoid drinking of alcoholic beverages, in addition to the usual dietary measures, in order to lower their serum cholesterol levels. The difference in the magnitude of the cholesterol responses to ethanol between dog and man poses an interesting problem as to the differences in cholesterol metabolism between these two species. It is hoped that a better understanding of the cause of this difference may be helpful for a better understanding of the mechanisms regulating serum cholesterol concentration. Studies in this direction are pursued at the present in this laboratory.

Summary

A review of the literature on the effects of alcohol on serum cholesterol concentration in man and different animal species has been given, as well as a summary of the experimental studies done in this laboratory on men and dogs.

The dog responds with a marked increase in serum cholesterol concentration when given alcohol at the dose of 1.65 g./kg./day. Administration of large amounts of alcohol to normal men (9 oz. of 100-proof whiskey per day) produces a small but significant increase of serum cholesterol concentration in normal men subsisting on a normal diet (about 38 per cent of fat calories).

The increase in serum cholesterol concentration produced by administration of ethanol in man is related to the intrinsic cholesterol level of the individual. Essential hyperlipemic patients respond with a very marked increase of serum cholesterol and other lipids, when given alcohol at moderate doses. The possible role of ethanol in maintaining high serum cholesterol levels in man has been discussed.

References

1. Keys, A.: J.A.M.A., 164:1912, 1957.
2. Keys, A., and Grande, F.: Am. J. Pub. Health, 47:1520, 1957.
3. Grande, F.: Rev. espan. cardiol., 11:310, 1957.
4. Keys, A., Anderson, J. T., and Grande, F.: Circulation, 19:201, 1959.
5. Portman, O. W., and Stare, F. J.: Physiol. Rev., 39:407, 1959.
6. Keys, A., Anderson, J. T., and Grande, F.: J. Nutrition, 70:257, 1960.
7. Cabot, R. C.: J.A.M.A., 43:774, 1904.
8. Edmondson, H. A., Hall, E. M., and Myers, R. O.: *In* G. N. Thompson: Alcoholism. p. 233. Springfield: Thomas, 1956.
9. Wilens, S. L.: J.A.M.A., 135:1136, 1947.
10. Kimura, N.: *In* A. Keys, and P. D. White: Cardiovascular Epidemiology. p. 22. New York: Hoeber and Harper, 1956.
11. Gertler, M. M., Driskell, M. M., Bland, E. F., Garn, S. M., Lerman, J., Levine, S. A., Sprague, H. B., and White, P. D.: J.A.M.A., 146:1291, 1951.
12. Spain, D. M., and Bradess, V. A.: A.M.A. Arch. Int. Med., 100:228, 1957.
13. Jankelson, O. M., Vitale, J. J., and Hegsted, D. M.: Am. J. Clin. Nutrition, 7:23, 1929.
14. Hobson, W., Jordan, A., and Roseman, C.: Lancet, II, 961, 1953.
15. Ducceschi, V., and Barilari, V.: Arch. di Fisiologia, 14:21, 1916.
16. Ducceschi, V.: Arch. di Fisiologia, 13:147, 1915.
17. Eberhardt, T. P.: Arch. Path. 21:622, 1936.
18. Feller, D. D., and Huff, R. L.: Am. J. Physiol., 182:237, 1955.
19. Morgan, A. F., Brinner, L., Plaa, C., and Stone, M. M.: Am. J. Physiol., 189:290, 1957.
20. Gottlieb, L. S., Broitman, S. A., Vitale, J. J., and Zamcheck, N.: J. Lab. & Clin. Med., 53:433, 1959.
21. Nikkila, E. A., and Ollila, O.: Circulation Res., 7:588, 1959.
22. Amatuzio, D. S., and Hay, L. J.: A.M.A. Arch. Int. Med., 102:173, 1958.
23. Grande, F., Heupel, H. W., Amatuzio, D. S., and Hay, L. J.: International Congress of Physiological Sciences. Summary of Communications, Compliment. p. 6. Buenos Aires, 1959.
24. Grande, F., Hay, L. J., Heupel, H. W., and Amatuzio, D. S.: Circulation Res., 8:810, 1960.
25. Grande, F., and Amatuzio, D. S.: Fed. Proc., 19: 237, 1960.
26. Jacobsen, E.: Pharmacol. Rev., 4:107, 1952.
27. Bloch, K., and Rittenberg, D.: J. Biol. Chem., 145:625, 1942.

A Consideration of

REITER'S SYNDROME

and

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THE PURPOSE of this paper is to present a case of psoriatic arthritis that possessed many misleading features. As will be shown in the case report, there were confusing symptoms and signs that made the consideration of related conditions necessary before the final diagnosis was made. Features of the related diseases will be enumerated in the differential diagnosis. Owing to the similarity in the clinical picture, the principal related condition to be considered was Reiter's syndrome.

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Numerous articles and case reports have appeared in the world literature since the original article was published by Reiter in 1916. The syndrome has been described in detail with the most emphasis upon the triad of symptoms: urethritis, conjunctivitis, and arthritis. These three cardinal symptoms are not always present simultaneously, and many writers believe that one or two of the components may be entirely absent. Other features have been added to the description of Reiter's syndrome and consist chiefly of cutaneous and mucous membrane lesions. Less-frequently-mentioned manifestations of Reiter's syndrome consist of polyneuritis, cardiac involvement, pleurisy, diarrhea, lymphadenopathy, fever, and loss of weight.

The diagnosis of Reiter's syndrome is often one of exclusion. Confusion may exist between this

DIFFERENTIAL DIAGNOSIS OF PSORIATIC ARTHRITIS AND REITER'S SYNDROME

	PSORIATIC ARTHRITIS	REITER'S SYNDROME
Sex	Equal in both sexes	Predominately male
Urethritis	Absent	Present—early
Conjunctivitis	Absent	Present—early
Arthritis	Worse in terminal phalanges, lumbar spine, sacroiliac	Knees, ankles, feet, sacroiliitis, shoulders, elbows, wrists, and hands
Constitutional symptoms	Minimal except for joint pain	Fever, weight loss, central nervous system and cardiovascular involvement, pleurisy and lymphadenopathy
Skin	Psoriasis-moderate Nail changes a prominent feature	Psoriasis-like involvement with most changes on genitals and extremities
Mucous Membrane	None	Usually genitals, oral mucosa
Course	Prolonged	Self-limited
Recurrences	Common	Frequent, usually with complete recovery
Histology	Parakeratosis with micro-abscesses, acanthosis, papillomatosis, clubbing of rete ridges, mild perivascular infiltrate in upper cutis	Parakeratosis, spongiosis, acanthosis, papillomatosis. Neutrophiles throughout all layers of some pustules. Heavy, acute infiltrate in corium

Allied Conditions

disease and psoriasis vulgaris with associated arthritis. Reiter's syndrome has been reported mainly in young, white, adult males, the age distribution being in the second and third decades, which is the same age group as the patients with psoriatic arthritis. There are a few isolated reports of the disease in females and children. The highest incidence is 10 per cent in women as reported by Paronen. The disease has also been reported in negroes. Reiter's syndrome is usually found in those who have not had a history of previous venereal diseases.

Paronen, as well as other writers, are of the opinion that both the dysentery and the urethritis are not causative factors in the disease, but are caused by the same etiologic agent. He stresses the factor of a more specific urethritis, pointing out that the complement fixation test for gonococci was negative in all his cases. The presence of diarrhea as a precursor in some cases and urethritis in others, suggests that there is more than one portal of entry for whatever organism causes the syndrome.

Reiter reported the isolation of a spirochete from the blood of his patient as the causative agent and termed the condition "spirochoetosis arthritica." No one else has been able to duplicate his finding of spirochetes. In Paronen's study of 344 cases, dysentery preceded the appearance of Reiter's disease in 96.4 per cent of the cases. This large series of cases was seen during the course of an epidemic of bacillary dysentery in Finland. Five of the twenty-three patients reported by Hall and Finegold had diarrhea. More frequently the history of extramarital or promiscuous sexual exposure suggest a venereal origin.

Shatin, Canizares, and Ladany in a recent paper propose the grouping of keratosis blennorrhagica with Reiter's syndrome—using modifying adjectives to indicate etiology. They would divide Reiter's syndrome into the gonococcal or the dysenteric type. Csonka, in reporting 185 consecutive cases, examined possible precipitating or predisposing factors and pointed out the relationship to previous urologic surgery. He could find no hereditary predisposition to the arthritis manifestations. There is a decided tendency for recurrences of the syndrome. Pleuropneumonia-like organisms have been suggested as the cause of Reiter's syndrome. The organism has been isolated in cultures of urethral discharge. The factor of virus etiology has not been carefully studied or eliminated.

Clinical Manifestations

One usually requires the presence of the triad of symptoms in order to make a diagnosis of Reiter's syndrome. The earliest symptom is most frequently urethritis. There may also be evidence of other urologic conditions such as prostatis, cystitis, or pyelonephritis. The urethritis is of a non-specific nature as evidenced by dysuria or frequency of urination, and purulent urethral discharge which may vary considerably in degree and duration—sometimes lasting several months. The discharge is less profuse than that seen in acute gonorrheal urethritis. It may vary from a sero-purulent to a heavy purulent or bloody secretion. The bacteriologic findings are usually negative, though the pleuropneumonia organism has been isolated from some patients.

The ocular manifestations appear within a short time after the urethritis. Conjunctivitis is the most frequent form of eye involvement and may vary greatly in its severity. It is usually bilateral, may be present only for a day, and may easily escape the patient's attention. Also reported have been cases of iritis, keratitis, corneal ulceration, and iridocyclitis.

The articular symptoms in Reiter's syndrome are the predominant ones and are the symptoms that bring the patient to the doctor. Changes come on acutely and are accompanied by a great deal of pain. In the great majority of cases, the arthritis is polyarticular involving commonly the knees, ankles, and feet. Other involved joints are the shoulders, elbows, wrists and hands singly or together. In contrast to rheumatoid arthritis, Csonka states that in Reiter's syndrome the joints of the lower limbs are affected three times as commonly as are the upper limbs. Csonka also stresses the frequent accompaniment of sacroiliitis. There may be evidence of acute periositis. The picture may resemble gonorrheal arthritis or gout. Acute arthritis in the sternal and shoulder area is often a prominent symptom.

A generalized polyarthritis that persists for a long time may develop in some cases. Tenderness over spinous processes and on motion of the spine are frequently present. Acute arthritic symptoms, involving one or two joints of the feet and clearing spontaneously in a week, may even be mistaken for gout. The majority of patients recover spontaneously and completely from one or several attacks. Residual joint damage may be found. Csonka reported more than one attack in 104 of 185 cases, and noted that with repeated attacks recovery was less complete. Fort estimates that in 20 per cent of recurrent attacks spondylitis will develop. In contrast, most reports agree that the changes in the larger joints (especially of the spin) are indistinguishable from those seen in patients with rheumatoid arthritis.

Duration of joint symptoms varies greatly. If only arthralgia is present recovery may begin in two weeks. In most cases the joints are cleared in three to eight months. Roentgen studies have shown osteoporosis and slight signs of bone destruction. Sacroiliitis is a common radiologic finding.

The prognosis for complete recovery is good and the x-ray changes are reversible. Mason and his collaborators state that "florid" periostitis is very suggestive of Reiter's syndrome and when it occurs on the plantar aspect of the calcaneum it is probably pathognomonic. Also Mason has the impression that changes of periosteal new bone in the calcaneum appear to be the only differentiating factor between Reiter's syndrome and rheumatoid arthritis.

The cutaneous manifestations of Reiter's syndrome is merely mentioned in some papers. On the other hand, M. Montgomery suggests that Reiter's syndrome be discussed as a tetrad rather than a triad of symptoms. Hall and Finegold agree that skin findings are an important part of the disease and are of considerable help in arriving

at a diagnosis. All of their cases showed some cutaneous evidence, the most frequent site of involvement being the genitalia. Hall and Finegold observed characteristic papular lesions on the prepuce or glans penis in seventeen of their twenty-three patients. The high incidence of mucocutaneous lesions is not generally appreciated. These lesions may be diagnostic and occur very frequently in the endemic (venereal) type of the disease. Montgomery and his group reported the incidence of mucocutaneous lesions in 80 per cent of their patients. Paronen, whose 344 cases were of the dysentery form, reported eighty-seven cases of penile eruptions representing 26.1 per cent of the total number of cases. The most frequent lesion appears on the penis as a perimeatal erosion or on the glans as balanitis circinata. The balanitis which is usually asymptomatic, is a papulosquamous circinate superficial process whose scales are loosely attached. These lesions are frequently seen at the corona and may involve the prepuce. Sometimes the lesions are coalescent, crusted, maculo-papules which are arranged in a serpiginous fashion. There may be small vesicles or superficial erosions. In some instances one sees a circinate, shallow erosion surrounding the urethral meatus. Ulcerative lesions may be seen on the penile shaft also.

The oral mucosa is the next most frequent site for mucocutaneous lesions. Here one may see grouped, annular erosions on the palate or buccal mucosa. They may be the residue of vesicles that rupture early to leave a relatively painless, red erosion. Some grouped vesicles strongly resemble herpetic stomatitis or erythema multiforme. Similar lesions may appear on the tongue, pillars and pharynx. Montgomery observed extragenital mucous membrane lesions in fourteen of his thirty-eight patients. The typical lesions are described as "dark red, slightly elevated, painless papules." Some lesions are to be found on the tongue as well. The nasal mucosa and perianal areas may also be involved.

The remaining cutaneous lesions of Reiter's syndrome are seen as sharply delimited, keratotic or parakeratotic plaques which are often confusedly referred to as keratodermia blennorrhagica. These lesions probably begin as vesico-papules that increase in size, become crusted and hyperkeratotic. They may be seen scattered over the glabrous skin, but most frequently involved sites are the palms and soles. There the papulo-vesicular lesions are covered with heavy crusts that interfere greatly with function. The lesions on the feet are located on the weight-bearing portion. The papulo-vesicles may be firm to palpation, seemingly solid. The skin between the toes may become macerated. There may be thick crust formation extending to the dorsum of the feet, even to appearing on the hands and arms. Crusts have been described in the scalp, about the hair margin and in the peri-umbilical area. External otitis may also be manifest. Urticaria too has been reported as a manifestation of Reiter's syndrome. The fingernails and toenails are involved in a manner that strongly resembles the changes seen in psoriasis. The nails are discolored and deep yellow keratin material accumulates under the distal portion. The entire nail may become elevated by this material. There is peri-ungual thickening, erythema, and some scaling extending over the terminal phalanges involving both the dorsal portion and the pads. Subungual abscesses may form and parts or all of the nail may be shed. Subungual hemorrhages are also reported. All cutaneous manifestations in Reiter's syndrome are reportedly seen most prominently in the patients with severe arthritis. The skin manifestations have also been reported more frequently in the venereal (endemic) types of the syndrome. Paronen makes very little mention of the cutaneous changes in the dysenteric type. Even histologically, the keratotic lesions of Reiter's syndrome resemble psoriasis of the pustular form.

The remaining changes associated with Reiter's syndrome are seen less often. The fever is quite variable or may be absent. It appears without chills and may rise 2.5 degrees or more. Neurologic symptoms point to both central and peripheral nervous involvement. There may be nerve palsies, shoulder girdle neuritis, evidence of root pain, and meningoencephalitis. There has also been reported trigeminal neuralgia and optic neuritis. Some writers maintain there is both endocarditis and myocarditis to be seen in Reiter's syndrome. Electrocardiographic changes have been observed. Some of the changes are attributed to a toxicity associated with the syndrome. Paronen lists pericarditis as an accompaniment in a few of his patients who had audible murmurs and friction rubs. He reported electrocardiographic changes in twenty instances.

Diarrhea is present in some cases. Paronen reported the largest series of 324 cases in which diarrhea occurred in 322 patients. It has been reported otherwise in only small groups. Five of the twenty-three patients reported by Hall and Finegold had diarrhea. Their cases, in contrast to Paronen's, revealed no pathogens.

Sequelae are few in Reiter's syndrome. Csonka tabulated sequelae in twenty-eight of his 185 cases. The changes consisted of recurrent iritis, foot deformities (periostitis of heels, pes valgus, pes cavus), ankylosis of peripheral joints, and sacroiliitis.

Psoriatic Arthritis

Psoriatic arthritis (arthropathic psoriasis, psoriasis with arthritis), a controversial subject ever since Alibert's original description is merging as a distinct clinical entity. There is a great deal of statistical, radiographic and chemical evidence to indicate that the concomitant presence of psoriasis and arthritis in the same individual is more than a chance occurrence, and is seen frequently enough to warrant the name of psoriatic arthritis. The incidence of arthritis in patients with psoriasis is greater than the incidence of arthritis in people who do not have psoriasis. The cause of arthritis associated with psoriasis is unknown. The theories regarding the etiology suggest a common factor for the cutaneous and joint diseases or the production of a toxin by the psoriasis in turn causing the arthritis. The second theory is of no greater help inasmuch as the primary cause of psoriasis is equally obscure. Reed and Becker note a close association between the severity of the arthritis and the cutaneous manifestation, with emphasis on the higher incidence of pustular psoriasis and psoriatic erythroderma. This is in contradistinction to Wright who found pustular psoriasis unrelated to the arthritis and who pointed out that alleviation of joint symptoms occurred in only one case when the skin was adequately treated. In this latter regard, Reed and Becker agree.

In psoriatic arthritis the association is between the skin manifestations and the joint symptoms. The cutaneous changes are frequently less extensive than the average involvement in uncomplicated psoriasis. The joint symptoms may occur in the ordinary variety of psoriasis. Some writers are of the opinion that the joint complications are seen more frequently in the pustular type of psoriasis. There are others who deny this relationship. Wright states that the palms and soles are not any more affected in patients with psoriatic arthritis than in patients with uncomplicated psoriasis. Reed and Becker state that, in general, the skin manifestations are atypical in character and distribution. The involvement on the genitals as well as the other sites of predilection, such as the elbows and knees, may present an exudative form of psoriasis. The sharply delimited plaque of psoriasis with its overlying lamellar scale is seen as the predominant feature much of the time. In this entity there is no correlated picture of conjunctivitis or urethritis. The confusion between Reiter's syndrome and psoriatic arthritis exists mainly in those cases that exhibit cutaneous or mucous membrane manifestations accompanying arthritis. In extreme cases, exfoliative psoriasis may present joint symptoms also. The outstanding psoriatic feature in psoriatic arthritis is the high incidence of nail involvement. The nail changes consist mainly of pitting, partial separation at the free border of the nail and thickening. The nails may also be eroded, irregularly laminated, and dirty white in color. The psoriatic nail is frequently brittle and the free border may be elevated by subungual keratomas. In psoriatic arthritis there is frequently involvement of the paronychial folds also with redness, edema, and scaling.

The articular lesions in psoriasis are often chronic and deforming. The most consistent joint involvement is in the hands with deformity of the distal interphalangeal joints. Epstein listed the highest incidence of joint involvement in the hands, knees, feet and ankles. Almost all the other joints may be involved. The distribution of the affected joints in rheumatoid arthritis and psoriasis is the same except that in psoriasis distal interphalangeal joint involvement is closely related to changes in the nails.

The roentgenologic changes in psoriatic arthritis are considered by many to be destructive. Most of the findings are concentrated in the digits and the spine. In x-ray of the hands, the predilection is for the terminal interphalangeal joints where erosion and fusiform change in the tips of the

terminal phalanges is seen. There is a high incidence of ankylosis, spondylitis, erosive arthritis, and sacroiliac involvement.

By way of laboratory help, Reed and Becker concluded that there was an unmistakable difference between rheumatoid and psoriatic arthritis. In addition to the help from the latex fixation test they found a marked elevation of globulins in the electrophoretic studies performed upon psoriatic patients. The elevation of β-(beta) globulin was pronounced.

The patient may appear with a painful arthritis, mucocutaneous lesions, and a readily obtained history of urethritis and conjunctivitis. The concomitant signs of arthritis and keratodermic lesions may mislead one to make a diagnosis of Reiter's syndrome rather than psoriasis as illustrated by the case presented.

Case Presentation

History.—A white, unmarried laborer, aged forty, was admitted for the first time on May 23, 1955 to the Minneapolis Veterans Hospital. He presented the complaint of a painful left hand of six days' duration. He had been previously hospitalized at a private hospital in 1949 with a diagnosis of rheumatoid arthritis involving many joints. About ten days prior to this admission he noted pain and stiffness in the left hip and pain in the right costovertebral angle area. Nine days before admission, the patient noted a creamy, uretheral discharge accompanied by dysuria. The patient received penicillin on each of three consecutive days without change in his condition. He later received sulfathiazole pills and an antibiotic capsule every six hours, with no appreciable change in the urethral discharge. Six days before admission, the patient developed a slight infection in the left thumb and the following day noted pain and swelling of the left hand and wrist. The only skin involvement at the time consisted of discoloration of all his fingernails and toenails. He had conjunctivitis which had developed one day after the urethral discharge.

Physical Examination.—Temperature 99.2. Pulse 80 and regular. Blood pressure 134/100. Patient was a well nourished, white man in no acute distress. There was a mild mucopurulent conjunctivitis as well as a purulent drainage from the right ear. A purulent urethral discharge was also present. The foreskin was reddened and appeared irritated. The prostate was enlarged and somewhat boggy. Swelling and redness of the left hand and to a lesser degree to the left wrist was recorded. There was a small paronychial infection of the left thumb. Much crusting was present on the interdigital webs of the feet. There were multiple raised lesions measuring 3 to 5 mm. in diameter and having a cornified center located on the soles and heels.

Laboratory Studies.—On admission the hemoglobin was reported as 13.1 grams. The sedimentation rate, 81 mm. per hour. The white blood count was 11,700 with 71 neutrophils, 18 lymphocytes, 7 monocytes, 2 eosinophils, and 2 basophils. On June 24, 1955 the hemoglobin was reported as 12.4 grams. The sedimentation rate, 92 mm. per hour. On admission the urinalysis was negative except for a packed field of white blood cells. Subsequent urinalysis showed varying numbers of white blood cells. Culture of the urethral discharge showed nonhemolytic streptococci. There was no evidence of gonorrhea on culture of the discharge. Mid-stream urine culture was negative for gonococci. Two blood cultures were negative. Smear and culture of the material from the right knee joint was also negative. Biopsy specimen of a skin lesion was read as keratosis blennorrhagica. The upper urinary tract was not well visualized. An intravenous pyelogram showed poor viscualization of the caliceal systems bilaterally with no particular abnormalities suggested. X-ray examination of the left hand showed minimal changes in the distal portion of the proximal phalanx of the fifth digit.

Hospital Course.—By May 31, 1955 the left costovertebral pain and tenderness had disappeared. Therapy was started with Meticorten on June 1, 1955 after a clinical diagnosis of Reiter's syndrome had been made. On June 15, 1955 the Meticorten was increased to 30 mg. per day. The lesions on the genitalia were unimproved while those on the feet showed slight improvement. Similar skin lesions were beginning to develop on the palms. On June 27, 1955 after the Meticorten was increased to 10 mg. every four hours, the patient showed some gradual improvement in his joint signs and symptoms. He was transferred to the Dermatology Service on July 1, 1955 because of the severe eruption of the feet, hands and groin. After the skin lesions became stable, the Meticorten was decreased from 45 mg. to 40 mg. daily. Inasmuch as the skin was under good control and steroid therapy and arthritis required further management, the patient was transferred back to the Medical Service on September 8, 1955. It was decided to slowly reduce his Meticorten over a one-month period. On October 17, 1955, he was started on butazolidine, 200 mg., t.i.d. The patient did well on this medication with gradual relief of joint pain. The butazolidine was gradually reduced to 100 mg., daily. On November 18, 1955 the patient began to complain of a slowing of the urinary stream and difficulty in starting the stream. There was no associated dysuria. The patient was seen in consultation by the Urology Service and was found to have a posterior bulbar stricture. He gave a history of having had

gonorrhea in 1936. While the patient was on Genito-Urinary Service, a urethrogram done on December 9 showed multiple prostatic and periurethral abscess pockets and a false passage in the bulbar urethra. There was mild trabeculation of the bladder and the lateral lobes of the prostate nearly met in the midline. An 18 Foley catheter was left indwelling until December 14. Dilatation was easy with the 28 Van Buren sound on December 19 under local anesthesia. Dilatation was recommended in another three weeks and he was sent on leave with a diagnosis of: (1) Reiter's disease and (2) Urethral stricture.

The patient was admitted about January 1, 1960 to Fargo, North Dakota VA Hospital with an eruption on the feet, right elbow and hands. According to him this was similar to the eruption he had while hospitalized in 1955. He also complained of painful aching of the feet, neck, dorsal spine, right shoulder, right elbow, and right wrist. The principal physical findings were in the skin.

Skin.—"Psoriatic" lesions were noted on the right elbow, in the palms and interdigital webs. The feet on the dorsum presented crusted papular lesions. The soles were thickened and showed considerable desquamation. The nails of both feet were likewise involved. Laboratory studies were non-contributory except for a mid-stream urine culture which was reported containing Aerobacter Aerogens and a streptococcus. During the hospital stay the patient was treated with tar ointment topically. He was given Medrol and sodium salicylate for relief of the joint pains. Marked improvement was noted early, but with reduction of the steroid the dermatitis flared up mildly. He was discharged with a diagnosis of "Rheumatoid arthritis with a psoriasis component." This forty-five-year-old white man was re-admitted to Minneapolis VA Hospital on February 18, 1960, with the chief complaint of a flare of his dermatitis and arthritis beginning August 1959. He was then well for two weeks after discharge from the Fargo, North Dakota VA Hospital, when he again had an exacerbation of his arthritis and dermatitis.

Physical Examination.—Patient was a well developed, obese white man in no acute distress. Blood pressure was 144/90; pulse was 80. Examination of the scalp revealed yellow scaling plaques extending over the hair-line in the post-auricular region. Examination of the genitalia revealed lichenification and some scaling on the scrotum as well as some scaly papules on the glans. Rectal examination revealed an enlarged prostate. Examination of the extremities revealed limitation of motion in the shoulder joints. There were erythematous, scaly plaques studded with pustules on the palms and soles, some scaly papules and plaques over the trunk, especially on the buttocks and around the anus. Thickening and discoloration of both thumb nails and all the toenails was noted.

Laboratory Findings.—Sedimentation rate was 110 mm. per hour. Urine culture showed greater than 5,000 colonies of *Aerobacter aerogenes*. Urethrogram showed diffuse demineralization throughout visualized portions of the spine and pelvis which was compatible with rheumatoid disease. There was also evidence of a rather marked stricture at the membranous portion of the urethra. Chest x-ray, urinalysis, CBC, VDRL slide test, alkaline and acid phosphatase, Uric acid, BSP, serum urea nitrogen, fasting blood sugar, serum transaminase, and electrocardiogram were within normal limits.

Hospital Course.—The patient was given 3 per cent crude coal tar for use on the body and 10 per cent ammoniated mercury in aquaphor to the scalp. On this regime his psoriasis cleared. He was referred to Urology for treatment of the urethral stricture. The Rheumatology consultant suggested giving the patient 1 gram of aspirin q.i.d. and a course of butazolidine. When the patient did not respond, Medrol was given. This regime along with physical therapy gave the patient much relief of his arthritis. A final diagnosis of psoriatic arthritis was made.

Discussion

The above case points out the difficulty encountered in a differential diagnosis between Reiter's syndrome and psoriatic arthritis. Sometimes one must wait a long time during the evolution of the disease before arriving at a conclusion. At the time of the first hospitalization the patient gave a history of purulent urethral discharge and conjunctivitis associated with paronychia, dermatitis, and arthritis. With that picture in mind, one can readily understand why a diagnosis of Reiter's syndrome was made. However, as a youth, the patient had had gonorrhea followed by a residual urethral stricture and prostatitis. The joint symptoms cleared completely. About five years later the same symptoms recurred. At the time of the last examination the cutaneous and nail finding were distinct for psoriasis. There was no evidence of conjunctivitis. There was a urinary infection with a positive culture for *Aerobacten aerogenes*. The psoriasis improved with local treatment. It is the writer's opinion that the patient had psoriasis with arthritis throughout his illness.

A summary and comparison of Reiter's syndrome and psoriatic arthritis can be graphically outlined in an abbreviated fashion emphasizing the features of arthritis, location of eruption, genito-urinary findings and course of the disease.

References

1. Buchan, J.: Reiter's disease: A review of the present position. Proc. Roy. Soc. Med., 48:432 (June) 1955.
2. Csonka, G.: The course of Reiter's Syndrome. Brit. M. J., 1088 (May 10) 1958.
3. Csonka, G.: Involvement of the nervous system in Reiter's Syndrome. Am. Rheum. Dis., 334 (Sept. 17) 1958.
4. Csonka, G.: Reiter's syndrome; theories and facts. Excepta Medica, 13:8:381 (Aug.) 1959.
5. Guck, J., and Wolf, J.: Monoarticular and destructive arthropathy in Reiter's syndrome. Am. J. M. Sc., 224:653 (Dec.) 1952.
6. Hall, W., and Fregold, S.: Reiter's syndrome; a study of 23 cases. Int. Med., 38:3:533 (Mar.) 1953.
7. Hollander, J.: Reiter's disease. M. Clin. North America, 6, 7 (May) 1946.
8. Jackson, W.: Reiter's disease. Brit. M. J., 197 (Aug.) 1940.
9. Larson, E., and Zoeckler, S.: ACTH in Reiter's syndrome. Am. J. Med., 14:307 (March) 1953.
10. Lever, W., and Crawford, C.: Keratosis blennorrhagica without gonorrhea. Arch. Dermat. & Syph., 49:389 (June) 1944.
11. Madden, J.: Psoriasis. Minnesota Med., 22:381, 1939.
12. Mason, R.: A comparative radiologic study of Reiter's disease, rheumatoid arthritis and ankylosing spondylitis. J. of Bone & Joint Surg., 41:1:137 (Feb.) 1959.
13. Miller, C. O., and McIntyre, D.: A syndrome termed Reiter's disease. Ann. of Int. Med., 23:673 (Oct.) 1945.
14. Montgomery, M.: The mucocutaneous lesions of Reiter's syndrome. Ann. of Int. Med., 51:1:99 (July) 1959.
15. Movioglu, H., and Tiessinger, Leroy: Reiter's syndrome. Missouri Med., 55:3:228.
16. Nunemager, J.: Psoriatic arthritis. Ann. Int. Med., 33:4:1016.
17. Oates, J., and Hancock, J.: Neurologic symptoms and lesions occurring in the course of Reiter's disease. Am. J. M. Sc., 238:1:115 (July) 1959.
18. Oates, J., and Csonka, G.: Reiter's disease in the female. Am. Rheum. Dis., 18:37 (Mar.) 1959.
19. Ogryzlo, M., and Graham, W.: Effects of the pituitary adrenocorticotropic hormone and cortisone. J.A.M.A., 144:1239 (Dec. 9) 1950.
20. Paronen, I.: Reiter's disease: A study of 344 cases observed in Finland. Acta med. scandinav., (Supplement) 212, 1949.
21. Plenk, H. P.: Psoriatic arthritis. Am. J. Roentgenol., 64:4:635.
22. Rinkoff, S.: Reiter's disease; report of a case in a woman. J.A.M.A., 148:9:577 (Apr.) 1960.
23. Reed, W., and Becker, S.: Psoriasis and arthritis. A.M.A. Arch. Dermat., 81:4:577 (Apr.) 1960.
24. Shatin, H., Carizaris, O., and Ladany, E.: Reiter's syndrome and keratosis blennorrhagica. A.M.A. Arch. Dermat., 81:4:551 (Apr.) 1960.
25. Sherman, M.: Psoriatic arthritis. J. Bone & Joint Surg., 34A:831, 1952.
26. Steine, E., and Schneider, B.: Psoriatic arthritis. Ann. Int. Med., 38:3:512 (Mar.) 1953.
27. Taxworthy, D.: ACTH and cortisone in the treatment of severe Reiter's syndrome. Ann. Int. Med., 44:1:52 (Jan.) 1956.
28. Wright, V.: Psoriasis and arthritis. Brit. J. Radiol., 30:351:113 (Mar.) 1957.
29. Wright, V.: Psoriasis and arthritis. Brit. J. Dermat., 69:1 (Jan.) 1957.
30. Wright, V.: Psoriatic Arthritis. Arch. Dermat. & Syph., 80:65 (July) 1959.
31. Wrigley, F.: Reiter's disease. Brit. M. J., 199 (Aug. 10) 1946.
32. Epstein, E.: Psoriatic arthritis. Arch. Dermat. & Syph., 40:547, 1939.
33. Bulletin on Rheumatic Diseases, Vol. VIII, No. 7, March, 1958.

The Management of

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AN ASYMPTOMATIC GOITER is a frequent finding in the course of a physical examination. With the increasing life expectancy of the population the incidence of nodular goiter has also increased and the clinician is continually presented with the problem of management of nodular goiter. In each case, he must make a decision whether to advise surgical removal or merely observation. This decision is often a difficult one and is based primarily on clinical judgment. The following discussion is an attempt to outline and evaluate critically the many factors involved in management of goiter and thyroid cancer.

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Incidence of Nodular Goiter

There is considerable disagreement as to the true incidence of nodular goiter in the general population. Clinical studies and autopsy statistics are at variance. Vander and associates[1] examined 5,000 normal persons between thirty and fifty-nine years of age and found palpable nodular goiters in 4 per cent, three-fourths of which were classified as solitary nodules. Miller[2] found asymptomatic nodular goiters in 11 per cent of women. and Crile and Dempsey[3] diagnosed them in 4 per cent of patients of both sexes hospitalized for non-thyroid disorders. Perlmutter and Slater[4] reported that 4 per cent of a group of 1,000 persons without thyroid complaints had nodular goiters, and of these, 60 per cent were solitary nodules.

The incidence of nodular goiter found in routine autopsies is higher; however, many of these

Table 1
Comparison of Clinical Characteristics of Benign Nodular Goiter and Thyroid Carcinoma

BENIGN GOITER	THYROID CARCINOMA
Soft	Hard
Discrete	Irregular, invasive
Finely multinodular	Large nodules or single nodule
Stable size	Enlarging
No adenopathy	Regional adenopathy
Movable goiter	Fixed mass
Long duration	Short duration
"Hot nodule"	"Cold nodule"
Normal voice	Hoarseness
Elderly	Young

THYROID CANCER

goiters are not detectable clinicaliy. If any thyroid nodule regardless of size is included, the frequency of nodular goiter at autopsy is over 50 per cent.[5] If it is assumed that only nodules 1 cm. or more in diameter are palpable and the others are excluded, the autopsy incidence of nodular goiter is then 8 to 12 per cent.[5-7]

It may be generalized from these and other studies that the incidence of clinically detectable nodular goiter in the adult population is between 4 and 8 per cent, and that about 60 per cent of these goiters will present as solitary nodules of varying size.

Incidence of Thyroid Cancer

There is even more disagreement as to the incidence of thyroid carcinoma presenting as nodular goiter. In studies on surgical material, the incidence of cancer has been reported to be as high as 10 per cent in multinodular goiters and 33 per cent in solitary nodules of the thyroid. If patients with a preoperative diagnosis of thyroid cancer are excluded, the incidence is then given as 4 to 8 per cent of all nodular goiters removed.[4] In a series of 3,247 thyroidectomies for nodular goiter performed at the Mayo Clinic, carcinoma was found in 7.5 per cent.[8] Excluding cases in which carcinoma was suspected before operation, the incidence of cancer was 3.8 per cent. Dailey, Soley, and Lindsay[9] reported that thyroid cancer was found in only 0.2 per cent of autopsies, but was present in 4.8 per cent of their surgical cases. One thyroid cancer was reported from every 429 autopsies, compared to one cancer found in every twenty-one thyroidectomies for nodular goiter. Sokal,[10] in compiling a review of autopsy studies, reported the average incidence of thyroid carcinoma to be 0.1 per cent in 100,000 routine

autopsies. Hazard and Kaufman[11] found cancer in only 1.5 per cent of nodular goiters at autopsy, and Hull[7] reported only three unexpected cancers in a careful autopsy study of 221 thyroid glands. Alexander[12] and Hurxthal and Heineman[13] presented extensive reviews of the literature on the incidence of thyroid cancer.

It is unlikely that the true incidence of thyroid carcinoma in nodular goiter is as high as surgical studies would imply. Patients having thyroidectomies for nodular goiter are a highly selected group and usually carcinoma is suspected. Since nodular goiter is present in about 40,000 persons per million population, an 8 per cent incidence of carcinoma would indicate about 3,000 thyroid cancers per million population. Actually only about twenty-five thyroid cancers per million population are diagnosed each year.[12,14]

Diagnosis of Thyroid Cancer

The differentiation of thyroid carcinoma from benign nodular goiter is based primarily on clinical findings. The character of the mass is important. A stony hard, fixed thyroid mass, hoarseness, and palpable cervical lymph nodes all suggest malignancy. A rapidly enlarging goiter is suggestive of cancer and a localized solitary mass is more suspect than a multinodular goiter.

Benign nodular goiter is more common in women than men in a ratio of 5:1, but thyroid cancer is more frequent in men (1.7:1). The incidence of benign nodular goiter increases with age particularly after sixty. In children under fourteen years of age, about one-third of all nodular goiters prove to be carcinoma,[8] and 2 to 3 per cent of all thyroid cancer occurs in this age group.

The length of time a goiter has been present does not help much in the diagnosis of carcinoma. In the Mayo Clinic series[8] about 40 per cent of patients with thyroid cancer had a known goiter for one year or more. 30 per cent for at least five years, and 20 per cent for ten years or longer.

Toxic goiter is less likely to be cancer. The incidence of carcinoma in toxic nodular goiter has been reported to be 1 per cent, and in toxic diffuse goiter 0.5 per cent. Sokal,[10] however, disagreed with this concept. Calcification in a goiter does not always indicate it is benign, since calcium may be present in papillary carcinoma of the thyroid.

The characteristic clinical features of benign goiter and thyroid carcinoma are compared in Table I.

Thyroid function tests are generally not helpful in differentiating thyroid cancer from benign goiter. Function tests are normal except in the rare cases where carcinoma or lymphoma involves the gland diffusely and produces myxedema. In recent years the measurement of differential uptake of radioiodine over a suspicious thyroid nodule and the remainder of the normal thyroid gland has been of some assistance. The most refined techniques use an automatic scanning scintillation detector over the thyroid gland, producing a radioactivity pattern of the goiter (scanogram or scintigram). With a scanogram it is possible to establish the relative concentrations of radioiodine in different areas of the goiter. Through this technique the concept of "hot" and "cold" thyroid nodules has evolved, hot nodules concentrating more and cold nodules less radioactivity than the surrounding normal thyroid tissue. Malignant tumors almost invariably concentrate less radioiodine than the adjacent normal gland.[15-17] Means reports that he has never found carcinoma in a hot nodule. Perlmutter and Slater[4] studied eighty-five patients with solitary thyroid nodules who ultimately had thyroidectomies, and



Fig. 1. Large discrete mass left lobe of thyroid gland stable in size for five years. Remainder of gland not palpable. Scanogram reveals increased concentration of I^{131} in mass ("hot nodule").

found no cancers in twenty-four hot nodules, 20 per cent cancer in warm nodules, and 32 per cent cancer in cold nodules. They suggest that warm and cold nodules be classified together as cancer-suspect. Johnson and Beierwaltes[18] reported similar results. However, most benign thyroid adenomas also are warm or cold nodules. In general, hot nodules are very unlikely to be carcinoma and cold nodules should be treated as possible cancers. Although the scanogram is helpful, it should not be used as the sole basis for deciding whether or not to remove a suspicious goiter.

A typical "hot" nodule, is illustrated in Figure 1, and "cold" nodules in Figures 2 and 3. The value of the scanogram in determining the completeness of a total thyroidectomy, and in following the course of thyroid cancer after surgery, is shown in Figures 4 and 5. This patient had surgical excision of the right lobe and isthmus of the thyroid gland for papillary adenocarcinoma in 1943. In 1959 a metastasis to a lymph gland in the right lateral neck was removed. A scanogram at that time revealed concentration of I^{131} to the left of the thyroid cartilage in what appeared to be a normal left thyroid lobe (Fig. 4). Surgical exploration of the neck was performed and a normal left thyroid lobe was removed. No other normal thyroid tissue or carcinoma were found in the neck and the thyroidectomy was considered complete. The patient did not become hypothyroid, and a scanogram was again made eight weeks after surgery (Fig. 5). The scanogram now revealed an area of I^{131} concentration to the right of the midline. Although this new area of I^{131} concentration may have represented normal thyroid tissue left behind at surgery which subsequently hypertrophied, the patient was treated with a large dose of I^{131}. She then became hypothyroid and a scanogram revealed no concentration of I^{131} in the neck.

Removal of every nodular goiter regardless of size and character as a prophylaxis against cancer is not feasible or indicated. The number of thyroidectomies to be done would be overwhelming, and the morbidity and mortality resulting from mass goiter eradication would far outweigh the small gain in picking up a few unsuspected thyroid carcinomas. The concept that carcinoma arises from a previously benign adenoma of the thyroid is no longer accepted, and prophylactic surgery is not warranted on this basis.

Needle biopsy of a possible malignant thyroid mass should not be performed, since it is possible to disseminate the tumor locally. In addition, a needle biopsy may be misleading, for the diagnosis of carcinoma frequently requires multiple sections from different areas of the mass.



Fig. 2. Circumscribed, smooth mass, upper pole right lobe of thyroid gland. Remainder of gland not palpable. Scanogram shows concentration of I^{131} in left lobe and isthmus but poor concentration in right lobe mass ("cold nodule"). Carcinoma found at surgery.

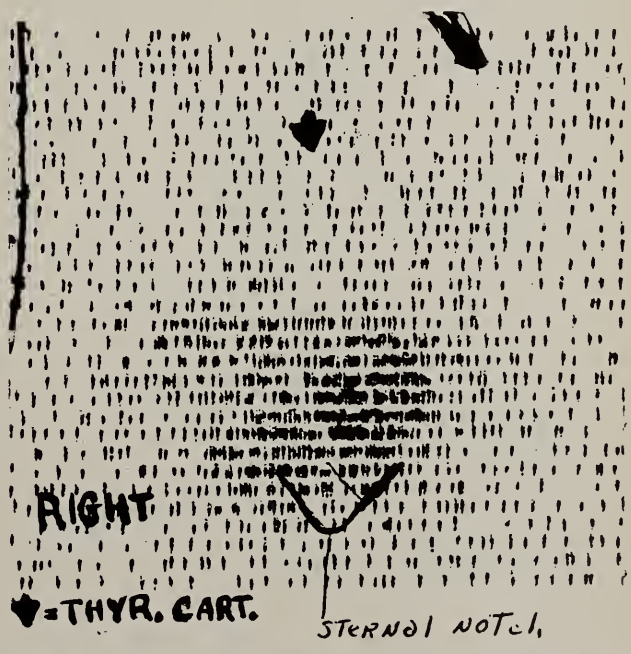


Fig. 3. Hard fixed mass right lobe of thyroid gland. Scanogram shows little concentration of I^{131} in mass ("cold nodule"). At surgery found to be Riedel's chronic thyroiditis.

Prognosis of Thyroid Cancer

The prognosis of thyroid cancer depends to a large extent on the histologic character of the lesion. Some thyroid carcinomas are relatively benign and remain localized without invasion or metastasis for years, while others may form small primary tumors spreading locally or produce distant metastases early in their course. In general, a lesion that cannot be completely resected is not curable. It has been stated that one-third of thyroid cancers are inoperable at the time the diagnosis is made.[8]

Papillary adenocarcinoma is the most frequently encountered thyroid malignancy, making up 50 to 60 per cent of most reported series.[19,20] They tend to metastasize to regional lymph nodes, but usually do not involve the capsule of the node, thus making excision possible. Invasion of the thyroid capsule and spread to adjacent tissue is common and makes total resection of the tumor difficult. Despite extensive nodal metastasis, the prognosis for long term survival and even cure is often excellent. Woolner and coworkers[21] reported fifty-three of fifty-eight patients with extensive nodal involvement alive and free of recurrence three to thirty-two years after operation. Four patients died of causes unrelated to thyroid cancer and one was not traced. In fifty-four of these cases only a modified neck dissection had been performed. These patients, however, all had so-called occult papillary carcinoma in which the primary tumor was very small but the metastasis to nodes very extensive. Papillary adenocarcinoma becomes widely disseminated through hematogenous spread only late in its course.

Malignant adenomas are usually well differentiated, encapsulated, and of low grade malignancy. Ordinarily they do not spread to lymph nodes as long as the tumor remains within its capsule. The malignant adenomas, however, are very prone to invade blood vessels and produce distant hematogenous metastases. If removed early, the chance for cure is good.

Giant cell and anaplastic carcinomas of the thyroid have a very poor prognosis. They are seldom cured and rapidly invade and metastasize. In the series of Frazell and Foote,[19] giant cell carcinoma had the worst outlook and all of their patients with this type were dead within five months after diagnosis.

There has been disagreement as to whether primary lymphoma of the thyroid ever occurs. How-



Fig. 4. Patient L. L.: Thyroid scanogram sixteen years after removal right thyroid lobe for papillary adenocarcinoma. Reveals normal functioning left thyroid lobe. No other radioactivity in neck.

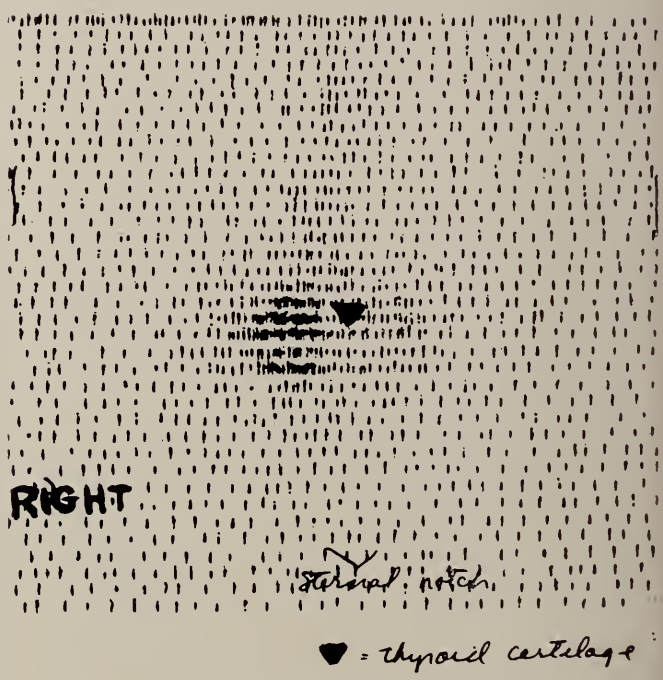


Fig. 5. Patient L. L.: Thyroid scanogram eight weeks after removal left thyroid lobe and right neck dissection. Patient euthyroid. Scanogram now reveals localized concentration I^{131} to right of midline. Treated with large dose of I^{131}.

ever, Walt, Woolner, and Black[22] recently reported eighteen cases of primary lymphoma of the thyroid, all either lymphosarcoma or reticulum cell sarcoma. These tumors were generally firm but not nodular. Eleven of their patients were dead within eighty-four months after diagnosis, but three patients with marked infiltration were still alive thirty-two, seventy-one and eighty-three months after subtotal thyroidectomy and irradiation.

Recently a medullary solid tumor of the thyroid has been described.[23] Histologically the tumor is solid and nonpapillary but frequently spreads to regional lymph nodes. It is usually well circumscribed but not encapsulated and contains deposits of amyloid. The prognosis is fair, and twelve of twenty-one patients were alive five years or more and one patient was alive twenty-seven years after diagnosis and treatment.

It is well established that many patients may live for years with persistent, incurable, thyroid cancer. Meisener and Legg[20] reported seventeen patients who lived ten years or longer with persistent thyroid cancer. The total duration of cancer in this group was ten to twenty-six years: nine patients lived ten to fourteen years and eight lived seventeen years or longer. Nine patients were still alive at the time of the report. The histologic classification was follicular in eight, papillary in six, and undifferentiated carcinoma in three patients.

Treatment of Thyroid Cancer

The treatment of thyroid carcinoma is still primarily surgical. Deep x-ray, drug therapy, and radioactive iodine are only adjuncts to adequate surgical resection of the tumor. The incidence of multicentric tumor origin within the gland is at least 20 per cent.[24] The considerations in surgery for anaplastic and giant cell tumors and lymphosarcoma are the same as for papillary cancers, although complete resection of the tumor is less frequently possible. Even in very extensive, unresectable lesions, removal of the primary tumor is worthwhile and may prolong survival.

Except for well differentiated follicular carcinoma and lymphoma, thyroid cancer is not radiosensitive. Irradiation therapy to the neck is advisable, however, in cases in which undifferentiated tumor has extended beyond the thyroid gland and cannot be completely excised. It may also be used in distant localized metastases which cannot be resected or treated with radioiodine. Although results are poor, some palliation may be obtained. Prophylactic irradiation following removal of localized thyroid lesions is not indicated.

Radioactive iodine has a limited usefulness in the treatment of thyroid carcinoma. Approximately 15 per cent of all thyroid cancers are well enough differentiated to concentrate significant quantities of radioiodine. In perhaps an additional ten per cent, tumor uptake of radioiodine can be induced or increased to the point where treatment is feasible. Excellent results with regression of tumor and prolongation of life have been reported in lesions which have a high radioiodine uptake.[25-29] However, the use of radioactive iodine is almost entirely restricted to the treatment of metastases in suitable cases, and is not treatment for the primary tumor. It is necessary to remove all functioning normal thyroid tissue before the tumor tissue will begin to concentrate enough radioiodine to make treatment possible. The remaining tumor is then stimulated maximally by endogenous pituitary thyrotropin. Administration of thyrotropin and antithyroid drugs, such as thiouracil, have been used as an additional stimulus to radioiodine uptake with variable success.[28] There is evidence that such stimulation may also result in more rapid growth of metastases.[29,30] Generally, if the tumor is not of the follicular, colloid-containing type to begin with, there is little chance that radioiodine concentration can be increased by any means. Radiation sickness, bone marrow depression, radiation pneumonitis, and pulmonary fibrosis have been produced by the large radioiodine dosage used.[31] Some patients have been kept alive and maintained in reasonably good health for ten years or longer by the repeated administration of radioiodine, and total dosage as high as 2,000 millicuries has been given over a period of years.

Replacement therapy with thyroid hormone is indicated in all patients in whom a complete resection of carcinoma is not possible, whether hypothyroidism is present or not.[29,30] It probably is advisable to place all patients on thyroid hormone after surgical resection of thyroid cancer. With the removal of much or all normal thyroid tissue in the process of resecting the thyroid

cancer, endogenous thyrotropin production is increased and results in increased growth of any tumor tissue remaining. Inhibition of this augmented thyrotropin production may be accomplished by thyroid hormone administration.

Summary

1. The true incidence of nodular goiter in the general population is between 4 and 8 per cent, and in about two-thirds the goiter is a solitary nodule.
2. The incidence of carcinoma in a nodular goiter is probably 3 to 4 per cent, and is more likely to be present in a solitary nodular goiter.
3. The diagnosis of thyroid cancer must be based primarily on clinical findings, and goiters which are clinically suspicious should be removed.
4. Surgical excision is the treatment of choice for thyroid cancer. Deep x-ray therapy and radioactive iodine should be used in the treatment of metastases which cannot be resected.
5. All patients, except those with very early localized lesions, should be placed on thyroid hormone after thyroidectomy.

References

1. Vander, J. B., Gaston, E. A., and Dawber, T. R.: Significance of solitary nontoxic thyroid nodules. New England J. Med., 251:970, 1954.
2. Miller, J. M.: Carcinoma and thyroid nodules: Problem in endemic goiter area. New England J. Med., 252:247, 1955.
3. Crile, G., Jr., and Dempsey, W. S.: Indications for removal of nontoxic nodular goiters. J.A.M.A., 139:1247, 1949.
4. Perlmutter, M., and Slater, S. L.: Which nodular goiters should be removed? New England J. Med., 255:65, 1956.
5. Hellwig, C. A.: Thyroid gland in Kansas. Am. J. Clin. Path., 5:103, 1935.
6. Schlesinger, M. J., Gargill, S. L., and Saxe, I. H.: Studies in nodular goiter: Incidence of thyroid nodules in routine necropsies in nongoitrous region. J.A.M.A., 110:1638, 1938.
7. Hull, O. H.: Critical analysis of two hundred and twenty-one thyroid glands: Study of thyroid glands obtained at necropsy in Colorado. Arch. Path., 59:291, 1955.
8. Beahrs, O. H., Pemberton, J. de J., and Black, B. M.: Nodular goiter and malignant lesions of the thyroid gland. J. Clin. Endocrinol., 11:1157, 1951.
9. Dailey, M. E., Soley, M. H., and Lindsay, S.: Carcinoma of thyroid gland: Clinical and pathologic study. Am. J. Med. 9:194, 1950.
10. Sokal, J. E.: Occurrence of thyroid cancer. New England J. Med., 249:393, 1953.
11. Hazard, J. B., and Kaufman, N.: Survey of thyroid glands obtained at autopsy in so-called goiter area. Am. J. Clin. Path., 22:860, 1952.
12. Alexander, M. J.: Occurrence of thyroid cancer in San Francisco. New England J. Med., 253:45, 1955.
13. Hurxthol, L. M., and Heineman, A. C.: Nodular goiter and thyroid cancer. New England J. Med., 258:457, 1958.
14. Sokal, J. E.: The problem of malignancy in nodular goiter-recapitulation and a challenge. J.A.M.A., 170:405, 1959.
15. Rawson, R. W., Skanse, B. N., Marinelli, L. D., and Fluharty, R. G.: Radioactive iodine: Its use in studying certain functions of normal and neoplastic thyroid tissues. Cancer, 2:279, 1949.
16. Dobyns, B. M., Skanse, B. N., and Maloof, F.: Method for preoperative estimation of function in thyroid tumors: Its significance in diagnosis and treatment. J. Clin. Endocrinol., 9:1171, 1949.
17. Dobyns, B. M., and Maloof, F.: Study and treatment of 119 cases of carcinoma of thyroid with radioactive iodine. J. Clin. Endocrinol., 11:1323, 1951.
18. Johnson, P. C., and Beierwaltes, W. H.: Reliability of scintiscanning nodular goiters in judging presence or absence of carcinoma. J. Clin. Endocrinol., 15:865, 1955.
19. Frazell, E. L., and Foote, F. W., Jr.: Natural history of thyroid cancer: Review of 301 cases. J. Clin. Endocrinol., 9:1023, 1949.
20. Meisener, W. A., and Legg, M. A.: Persistent thyroid carcinoma. J. Clin. Endocrinol., 18:91, 1958.
21. Woolner, L. B., Lemmon, M. L., Beahrs, O. H., Black, B. M., and Keating, F. R., Jr.: Occult papillary carcinoma of the thyroid: A study of 140 cases observed in a 30-year period. J. Clin. Endocrinol., 20:89, 1960.
22. Walt, A. J., Woolner, L. B., and Black, B. M.: Small cell malignant lesions of the thyroid gland. J. Clin. Endocrinol., 17:45, 1957.
23. Hazard, J. B., Hawk, W. A., and Crile, G., Jr.: Medullary (solid) carcinoma of the thyroid. A clinicopathologic entity. J. Clin. Endocrinol., 19: 152, 1959.
24. Black, B. M., Kirk, T. A., Jr., and Woolner, L. B.: Multicentricity of papillary adenocarcinoma of the thyroid. Influence on treatment. J. Clin. Endocrinol., 20:130, 1960.
25. Freedberg, A. S., Ureles, A. L., Lesses, M. F., and Gargill, S. L.: Pulmonary metastatic lesion successfully treated with radioactive iodine. J.A.M.A., 144:16, 1950.
26. Trunnell, J. B., Marinelli, L. D., Duffy, B. J., Hill, R., Peacock, W., and Rawson, R. W.: The treatment of metastatic thyroid cancer with radioactive iodine: Credits and debits. J. Clin. Endocrinol., 9:1138, 1949.
27. Seidlin, S. M., Rossman, I., Oshry, E., and Siegel, E.: Radioiodine therapy of metastasis from carcinoma of the thyroid. Six year progress report. J. Clin. Endocrinol., 9:1122, 1949.
28. Rall, J. E., Miller, W. N., Foster, C. G., Peacock, W. C. and Rawson, R. W.: The use of thiouracil in the treatment of metastatic carcinoma of thyroid with radioiodine. J. Clin. Endocrinol., 11:1273, 1951.
29. Maloof, F., Vickery, A. L., and Rapp, B.: On evaluation of various factors influencing the treatment of metastatic thyroid carcinoma with I^{131}. J. Clin. Endocrinol., 16:1, 1956.
30. Thomas, C. G.: Hormonal treatment of thyroid cancer. J. Clin. Endocrinol., 17:232, 1957.
31. Rall, J. E., Alpers, J. B., Lewallen, C. G., Sonnenberg, M., Berman, M., and Rawson, R. W.: Radiation pneumonitis and fibrosis: A complication of radioiodine treatment of pulmonary metastases from cancer of the thyroid. J. Clin. Endocrinol., 17:1263, 1957.

Frequency of Premature Beats

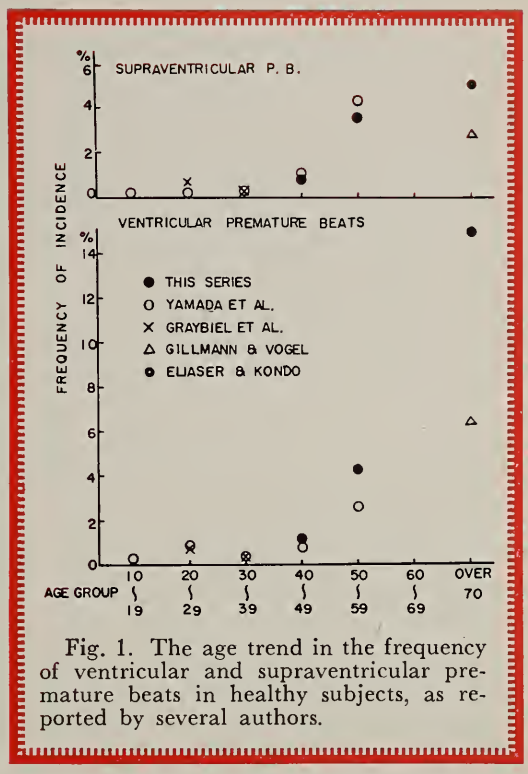


Fig. 1. The age trend in the frequency of ventricular and supraventricular premature beats in healthy subjects, as reported by several authors.

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in 715 healthy adult subjects

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IN CLINICAL routine electrocardiography, "frequent" premature beats are considered as "abnormal," and "occasional" premature beats are considered as "normal," but there is no clear indication of a separating critical value in the electrocardiographic literature. Thus, the judgment of a normal or abnormal frequency is highly arbitrary.

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An "abnormal" frequency of premature ventricular beats can be determined only on the basis of the distribution in a large sample of average, healthy population. This study was undertaken in order to provide such information, supplementing previous studies.[1-5] Our sample is limited to adults over forty years, since in this age range the prevalence of cardiovascular disease is greatest.

Material and Methods

The subjects were 606 healthy middle-aged men, 294 between forty and forty-nine years of age, 312 between fifty and fifty-nine, and 109 middle-aged women, fifty-one between forty and

TABLE I. AGE TRENDS OF THE FREQUENCY OF PREMATURE BEATS (P.B.) IN HEALTHY ADULTS AND THE STATISTICAL SIGNIFICANCE CALCULATED BY MEANS OF CHI-SQUARE TEST
(606 Men, 109 Women),

			Supraventricular P.B.				Ventricular P.B.				Total			
	No. of Subjects (A)	Total No. of Beats Observed (B)	No. Of Subjects (C)	C / A	Total No. of P.B. Observed (D)	D / B	No. of Subjects (E)	E / A	Total No. of P.B. Observed (F)	F / B	No. of Subjects (G)	G / A	Total No. of P.B. Observed (H)	H / B
40-49	345	19,142	3	0.87%	13	0.68‰	4	1.16%	11	0.57‰	7	2.03%	24	1.25‰
50-59	370	20,489	13	3.51	30	1.46	16	4.32	27	1.32	26	7.03	57	2.78
Total	715	39,631	16	2.24	43	1.08	20	2.80	38	0.96	33	4.62	81	2.04
Px^2				.02		.015		.01		.015		.007		.0007

forty-nine years of age, and fifty-eight between fifty and fifty-nine.

The male subjects were randomly selected from a group of approximately 3,000 employees of railroad companies, collected under supervision of Dr. H. L. Taylor, Laboratory of Physiological Hygiene, University of Minnesota. These subjects were carefully screened for the presence of any objective or subjective signs of disease by a survey including personal history, blood pressure, x-ray, electrocardiography, physical examination and laboratory tests.

Most of the group of women were from employees of the Mt. Sinai Hospital, Minneapolis, but additional female subjects were obtained from the Mutual Service Insurance Company (Dr. H. Blackburn), St. Paul, Minnesota and Asbury Hospital (Dr. J. Dahl), Minneapolis.

The conventional twelve leads were taken; there were at least 40, but usually 50 to 80 beats on each of the mounted records. Single or multiple premature beats, auricular, nodal and ventricular, were listed together with the number of regular beats for each individual. Escaped beats or escaped rhythm were not included; by definition, they are not premature.

Results

Since there was no statistically significant difference in the frequency of premature beats between the male and the female groups of this series, both groups were combined in the following analysis. Table I shows a cumulative listing of the number of premature beats, absolute, in per cent of individuals of the total group, and in per cent of the total number of beats.

Thirty-three subjects (4.62 per cent of the total group) had premature beats: in sixteen, they were supraventricular; in twenty subjects, they were ventricular premature beats. Three subjects had both types of premature beats (Table I).

The total number of premature beats was eighty-one, since some of these persons had two or more premature beats. The ratio of the total number of premature beats (81) to the total number of beats (39,631) of the 715 subjects of this group was 2.04 per thousand (Table I).

A noticeable difference in the frequency of premature beats was observed between the two age groups. The incidence of persons with premature beats was about four times higher in the older (fifty to fifty-nine years) than in the younger group (forty to forty-nine years). The ratio of the number of premature beats to the total number of beats was also higher in the older group. According to the chi-square test, these differences are statistically significant. The greater frequency of premature beats in the older group was true for premature supraventricular as well as ventricular beats (Table I).

TABLE II. THE RATIO OF THE NUMBER OF PREMATURE BEATS OBSERVED ON EACH OF THE RECORDS TO THE TOTAL NUMBER OF BEATS ON THE RECORD

Ratio	<2.0%			2.0-4.9%				5.0-7.4%			7.5-9.9%			10.0%<				Total			
	S.	V.	Total	S.	V.	S.&V.	Total	S.	V.	Total	S.	V.	Total	S.	V.	S.&V.	Total	S.	V.	S.&V.	Total
No. of Subjects	3	6	9	6	9	2	17	1	1	2	1	0	1	2	1	1	4	12	17	3	33
Percentage			27.3%				51.5%			6.1%			3.0%				12.1%				100.0%

S.: Subjects with Supraventricular Premature Beats
V.: Subjects with Ventricular Premature Beats
S.&V.: Subjects with both Supraventricular and Ventricular Premature Beats

In each subject with premature beats, the number of these beats was compared to the total number of beats observed on his record. In twenty-six of the thirty-three cases (78.8 per cent) less than 5 per cent of the beats (one in twenty or more beats) were premature (Table II), but in four cases over 10 per cent of the beats were premature. In regard to the total sample of 715 subjects, the incidence of subjects with a frequency of premature beats exceeding 10 per cent is very small (0.56 per cent).

Discussion

We have compared the results of this series with previous reports concerning normal groups[1-5] (Fig. 1). The results of the various authors agree quite well on two points: (1) ventricular premature beats are more frequent than supraventricular premature beats; (2) the frequency of the premature beats increases with age.

Although the higher incidence of ventricular premature beats as compared to that of the supraventricular beats has been noted by several authors,[4-8] the difference between the frequency of these two types of premature beats in this series is small and statistically not significant.

The increase in the frequency of premature beats between the two age groups, forty to forty-nine and fifty to fifty-nine, in this series, coincides remarkably well with the increase in these age groups of 4,236 Japanese industrial employes.[1] In all reports of normal groups available so far,[1-5] where at least 100 subjects were investigated, the frequency in age groups below thirty-nine years of age is smaller than in the forty to forty-nine age group of this series. The frequency of premature beats in healthy subjects older than sixty years is still higher than in the fifty to fifty-nine-year age group of this series (Fig. 1).

The results show that age is an important factor in the frequency of premature beats. It is of interest that the age trends of premature beats parallel the prevalence of coronary heart disease. It may be suggested, therefore, that an underlying cause for the age trends of premature beats may be small ischemic areas, giving rise to the formation of excitable foci.

Although the occurrence of premature beats observed in our material is not abnormal, it may well have some prognostic significance as an early sign of localized myocardial involvement. Therefore, a follow-up of subjects with frequent premature beats may be desirable. The arbitrary selection of a ratio of 10 per cent premature beats in an individual record used for the classification code proposed by Blackburn, Keys, Simonson, Rautaharju and Punsar[9] is supported by the present data. If anything this criterion is conservative.

Summary

1. The frequency of premature beats in a normal group of 606 men and 109 women, ranging between forty and fifty-nine years of age, was investigated.

2. The frequency of premature beats is much higher in the older group (fifty to fifty-nine years of age) than in the younger group (forty to forty-nine years of age) in regard to the number of beats as well as number of subjects. The difference was statistically significant.

3. The incidence of premature ventricular beats is slightly higher than that of premature supraventricular ones.

4. In 78.8 per cent of the subjects with premature beats they occurred less than once in twenty heart beats; but in four of the thirty-three persons they occurred once or more in ten heart beats.

5. In view of the age trend, it is suggested that premature beats may be due to small ischemic areas in the myocardium.

References

1. Yamada, K., Yamana, K., Mori, S., Teramoto, T., Iwatsuka, T., Okajima, M., Nakayama, R., and Tomita, Y.: Mass survey for cardiovascular disease. II. Results of a mass survey of 4,236 workers. Japanese Circulation J., 22:1, 1958.
2. Graybiel, A., McFarland, R. A., Gates, D. C., and Webster, F. A.: Analysis of the electrocardiograms obtained from 1000 young healthy subjects. Am. Heart J., 27:524, 1944.
3. Packard, J. M., Graettinger, J. S., and Graybiel, A.: Analysis of the electrocardiograms obtained from 1000 young healthy aviators. Ten years follow-up. Circulation, 10:384, 1954.
4. Gillmann, H., and Vogel, W.: Ueber das Elektrokardiogramm im Greisenalter. Deutsche Med. Wschnr., 80:283, 1955.
5. Eliaser, M., and Kondo, B. O.: The electrocardiogram in later life. Arch. Int. Med., 67:637, 1941.
6. Katz, L. N.: Electrocardiography. P. 316 Philadelphia: Lea & Febriger, 1946.
7. Brody, J. I., Golden, L. H., and Tobin, J. L.: A review of 3,369 electrocardiograms in young male hospitalized patients. Am. Heart J., 53:821, 1957.
8. Willius, F. A.: The heart in old age. A study of 700 patients 75 years of age and older. Am. J. Med. Sc., 182:1, 1931.
9. Blackburn, H., Keys, A., Simonson, E., Rautaharju, P., and Punsar, S.: The electrocardiogram in population studies—A classification system. Circulation, 21:1160, 1960.



Fig. 1. Demonstration by intravenous angiography of normal ascending aorta and arch with delineation of innominate, both common carotid, and left subclavian arteries.



Fig. 2. Forward intravenous angiogram of a patient with a pulsating mass in right subclavian area, shows kinking of common carotid arteries thereby excluding a solid mass or aneurysm.

Intravenous

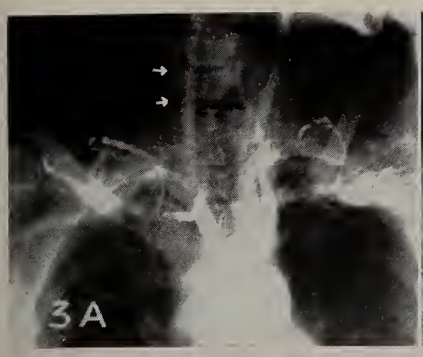
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EVER SINCE Moniz[8] introduced successful cerebral angiography in 1927, innumerable articles have appeared concerning the introduction of radio-opaque contrast media into venous and arterial routes. Forward intravenous cardioangiography, translumbar aortography, selective cardioangiography, and selective angiography are only some of the methods used, but these will not be reviewed here. The purpose of this paper is to re-emphasize the feasibility of intravenous angiography rather than reiterate the problems of other methods.[1,6,7] As a preoperative diagnostic procedure, this method is simple and requires a minimal number of instruments as compared with the others mentioned above.

As long ago as 1948, Weens,[13] as well as other authors[3,9,10,11] suggested intravenous aortography, particularly for nephrography. The reason for its advocacy was to avoid the complications of translumbar and direct renal artery selective angiography.[6,14] Steinberg has also advocated selective intravenous aortography for visualization of the thoracic aorta.[10]

One might assume that the relative lack of interest in this simple procedure was related to

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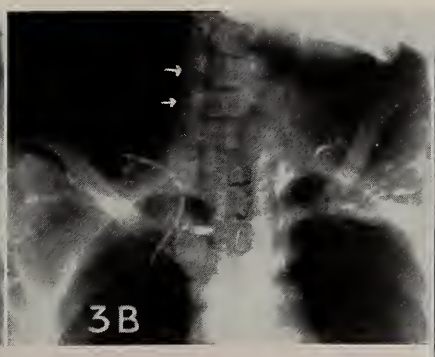


Fig. 3 (a and b). Clinical question of common carotid syndrome disproved by delineation of normal carotids and vertebral arteries as well as delayed jugular return.



Fig. 4. Stasis of contrast media in left atrium owing to mitral stenosis is shown, even on delay film, sixteen seconds after injection. Patient was studied because of an atypical mitral murmur, suggesting a left atrial tumor.

Angiography

its place in a small, well equipped, general hospital

the fact that the vascular bed was visualized only faintly by this method. This can be readily understood, for only 30 to 50 cc. of 70 per cent Diodrast was used. It was introduced through direct venopuncture, using a hand syringe. As a result, adult intravenous angiography was far from being vividly graphic. New contrast media renewed interest in the method.[4]

Bernstein and Greenspan[2,5] were impressed by the need for a relatively simple approach to the preoperative diagnosis and localization of aortic aneurysms and occlusions of the arteries which might be amenable to removal and replacement with prostheses. Because selective aortography and angiography, particularly in the group with occlusions of the iliac arteries, is not without hazards to the older and often debilitated geriatric patient, these authors advocated the revival of the intravenous method using a combination of higher concentrations of iodinated compounds in larger doses, rapid injection, and rapid film changers.

After the feasibility and safety of this method were proved, we were invited by R. H. Greenspan to join the project in order to study its application in both large and small hospitals.

The purpose of the project was not merely to

increase the scope of the original series at the University of Minnesota Hospitals but also to advocate it as a practical tool for use in smaller units where good laboratory, anesthesia, surgical, and surgical care units are available. Our experience has proved to our own satisfaction that this procedure has been a boon to vascular surgery at Mt. Sinai Hospital, Minneapolis. This has facilitated the handling of the older patient thereby limiting the use of selective angiography, operative or percutaneous, for special problems.

Technique

One of the most important phases of the procedure is the selection of the proper contrast media. In order to deliver a sufficiently concentrated bolus of contrast to the left heart and aorta, a large volume of concentrated iodinated contrast, either 90 per cent Hypaque or 85 per cent Renografin is used. The volume used is approximately 1 cc. per kg. up to a total of 100 cc. The average dose for an adult varies between 70 and 90 cc.

As one might suspect, the speed of injection is almost as important as the contrast media. A polyethylene venous catheter of maximal diameter (4 mm. outside diameter) is inserted into the antecubital vein as far as possible, usually 4 to 8 inches. It is a necessary adjunct, for trochar or needle injections were not as satisfactory. Using an Elema-Schonander mechanical injector, the bolus is injected in its entirety within 1 or 2 seconds.

We use the Decholin circulation time as a guide to the delay between injection of contrast and the beginning of the exposure sequence. The following times have proved to be satisfactory in an average sized adult.

Location	*Delay Between Injection and Exposure*
Right heart and pulmonary artery	no delay
Pulmonary vein, left atrium and left ventricle	2-3 sec.
Asc. aorta and aortic arch	5-6 sec.
Thoracic aorta and upper abdominal aorta	9-10 sec.
Aortic bifurcation	10-11 sec.

A Schonander rapid film changer is used at a rate of one to one-and-a-half exposures per second.

At this point one must acknowledge a recently published modification of intravenous aortography[12] in which the contrast media was injected simultaneously into both antecubital veins using a hand syringe technique. We prefer our technique for the reasons of more certain timing, speed of injection, and serial filming of the various phases of filling the vascular system. The hand technique relies on the manual changing of a limited number of cassettes. Thus, it is considered acceptable in a limited sense, if one is aware of the unpredictability of the speed of the hand injection and of the exact timing of the exposures.

The patient is sedated before coming to the x-ray department. A scout film is taken. While this is being processed, the circulation time is determined and the venous cut-down is performed. During these procedures, the patient is told about the intense, momentary flush reaction he will likely experience. With the preliminaries finished, the examination is completed with dispatch.

Uses of Intravenous Angiography

Now that the technique has become routine in our department, we use it for many purposes. It has proved to be extremely helpful in evaluating the great vessels of the neck, for example, common carotid arteries (Fig. 1). In this regard it is excellent for excluding innominate aneurysms or mediastinal tumors (Fig. 2) or both. We have held the opinion that it is not a substitute for cerebral angiography but have found it suitable for the delineation of the origin of the vertebral arteries and for demarcation of the jugular vein (Fig. 3a and 3b). We prefer selective cardioangiography, if technically feasible, in congenital heart disease or intracardiac chamber study. Nevertheless, one can demonstrate chamber defects or some valvular defects by this method, for example, high grade delay of outflow of contrast media from the left atrium in mitral stenosis (Fig. 4). We have found it helpful in delineating coarctations and the associated changes in the arteries in the region of the aortic arch as a consequence of coarctation (Fig. 5). It has proved extremely valuable in dilineating the cause and extent of occlusions of the arteries. It is of value in studying the aneurysmal changes in the thoracic aorta. A good example is that of a traumatic aneurysm immediately distal to the arch (Fig. 6). The abdominal aorta and its tributaries are usually well outlined (Fig. 10a). A malignant renal neoplasm is identified from the initial fill of its vessels, through the capillary phase, and the final "tumor stain" phase (Fig. 7).

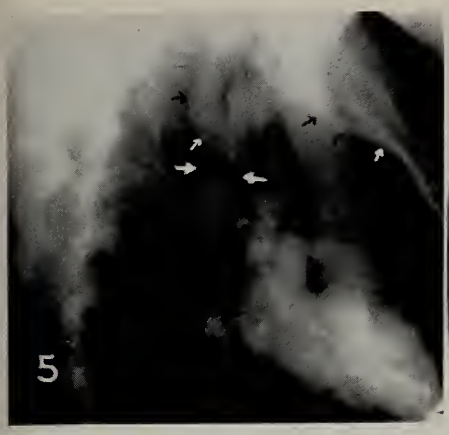


Fig. 5. Intravenous angiogram of a twenty-year-old girl with hypertension and absent pulses of the femoral arteries shows coarctation of the junction of the distal aortic arch and descending thoracic aorta. The aorta distal to this coarctation is not dilated intimating an extremely small aperture. The subclavian and internal mammary arteries are dilated. The dilated subclavian and internal mammary vessels and coarction site are indicated by arrows.

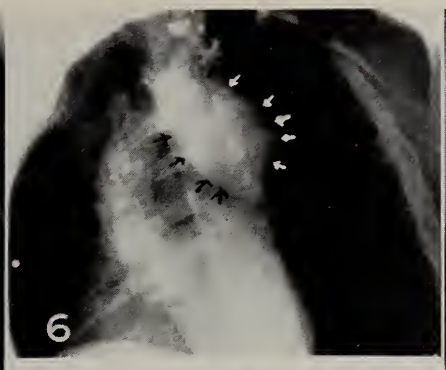


Fig. 6. A large post-traumatic spherical saccular aneurysm at the junction of the aortic arch and descending aorta.



Fig. 7. Increased blood supply to neoplasm of upper pole of kidney which on I.V.P. could not be differentiated from a cyst.



Fig. 8. Palpable abdominal aortic aneurysm. The aorta is "normal" below the renal arteries thereby prompting successful surgery. The arrows show renal arteries and aneurysm.

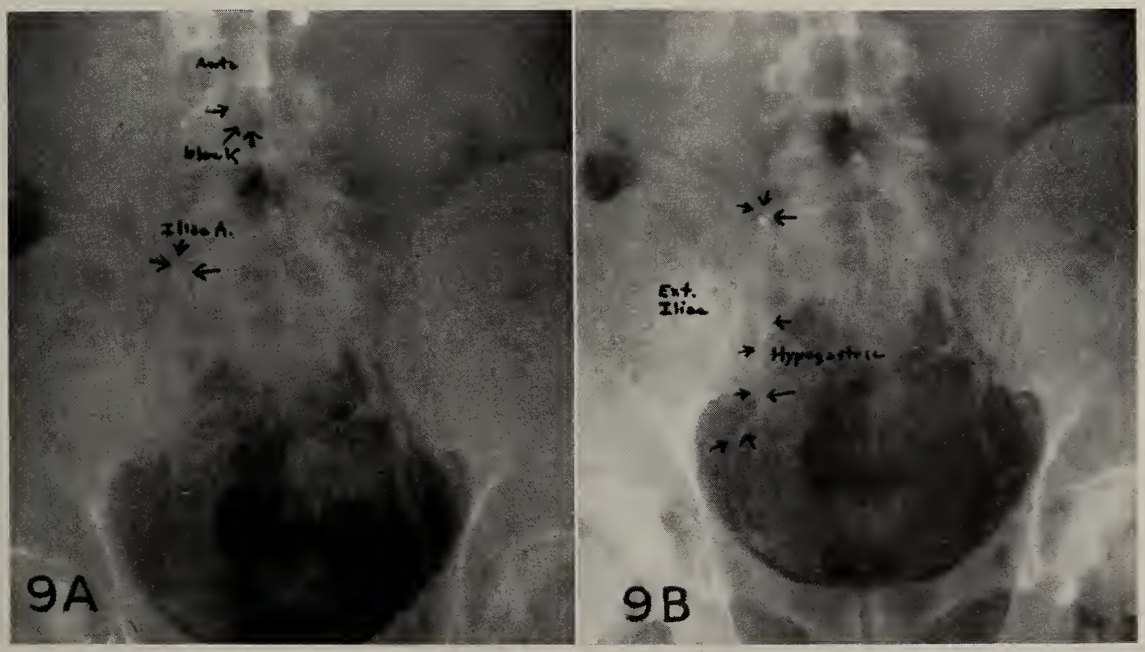


Fig. 9 (a and b). Decreased pulsations of the right femoral artery. Occlusion found in the right side of distal aorta. The external iliac artery is filled by collaterals. Hypogastric artery only partially filled.

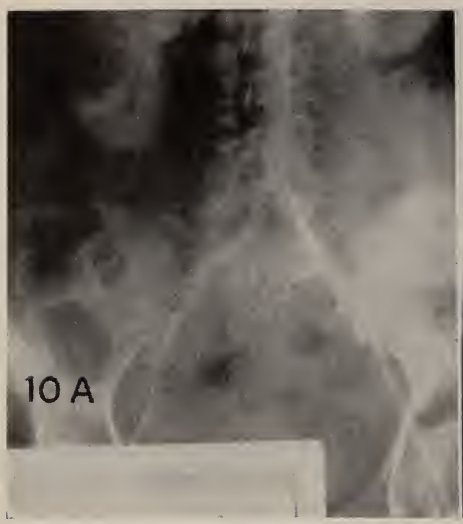




Fig. 10 (A) Decreased pulsations of right femoral artery. Survey femoral run-off cassette seen superimposed on femoral triangle. Aorta and iliacs are normal. Survey femoral run-off film showed poor caliber of femoral artery. (B) Direct femoral arteriogram confirmed above findings showing diminution of overall caliber of femoral artery and multiple plaques.



Fig. 11. Femoral artery run-off study performed because of lower extremity circulatory problem shows normal femoral arteries, and increased vascularization in pelvic bones in zones of known Paget's disease.

Abdominal aneurysms are obviously easily identified (Fig. 8). Distal aortic blocks are identified also as to site and extent prior to surgery (Fig. 9a and 9b). It can be used also to check on the femoral artery run-offs to determine the pressure of a distal femoral arterial block which can be confirmed by means of conventional direct femoral arteriogram (Fig. 10a and 10b). In one case in which it was desired to evaluate the femoral arterial run-off, an interesting aside was that of increased blood flow to the bone owing to Paget's disease (Fig. 11). It has been of value also in demonstrating decreased blood flow to an isolated kidney in a case of "idiopathic" hypertension.

Conclusion

Using the rapid injection of large quantities of highly concentrated iodinated contrast media coupled with a rapid film changer, one can employ intravenous angiography as a simple and safe means of diagnosing and evaluating multiple vascular and non-vascular lesions in the course of the great vessels and their immediate branches. The need and feasibility of surgical treatment can be determined.

References

1. Beall, A. C., Crawford, B. S., Couves, C. M., DeBakey, M. E., and Moyer, J. H.: Complications of aortography, factors influencing renal function following aortography with 70 per cent Urokon. Surg., 43-364-380 (Mar.) 1958.
2. Bernstein, E. F., Greenspan, R. H., and Loken, M. K.: Intravenous abdominal aortography, a preliminary report. Surg. 44:529-535, 1958.
3. Dublier, William, Jr., and Evans, J.: Peripelvic cysts of the kidney. Radiology, 71:404-408, 1958.
4. Finby, N., Poker, N., and Evans, J.: Ninety per cent hypaque for rapid intravenous roentgenography, preliminary report. Radiology, 67:244-245, 1956.
5. Greenspan, R. H., Bernstein, E. F., and Loken, M. K.: Intravenous aortography. Ann. New York Acad. Sc., 78:924-942 (July) 1959.
6. Idbohrn, H.: Tolerance to contrast media in renal angiography. Acta radiol., 45:141-154, 1956.
7. Kincaid, O. W., and Davis, G. D.: Abdominal aortography. New England J. Med., 259, 21:1017-1024 (Nov. 20) 1958.
8. Moniz, Egas: L'encephalographie arterielle, son importance dans la localisation des tumeurs cerebrales. Rev. neurol., 2:72-90, 1927.
9. Steinberg, I., and Finby, N.: Angiocardiography in the diagnosis of sacular aneurysm of the abdominal aorta, report of a case. New England J. Med., 255:204-207, 1956.
10. Steinberg, I., and Finby, N.: The importance of angiocardiography for visualizing the thoracic aorta. A.M.A. Arch. Surg., 74:29-38, 1957.
11. Steinberg, I.: Intravenous angiography: The twentieth year-editorial. Am. J. Roentgenol., 81:886-887 (May) 1959.
12. Steinberg, I., Finby, N., and Evans, J.: A safe and practical intravenous method for abdominal aortography, peripheral arteriography, and cerebral angiography. Am. J. Roentgenol., 82:758-772 (Nov.) 1959.
13. Weens, H. S., Olnick, H. M., James, D. F., and Warren, J. V.: Intravenous aortography and nephrography. Am. J. Med., 5:620-621, 1948.
14. Weens, H. S., Olnick, H. M., James, D. F., and Warren, J. V.: Intravenous nephrography: A method of roentgen visualization of the kidney. Am. J. Roentgenol., 65:411-414, 1951.

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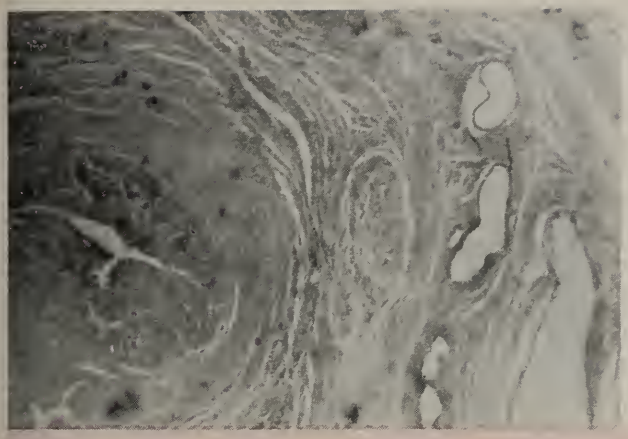


Fig. 1. Epithelial offshoots from the isthmic portion of the fallopian tube.

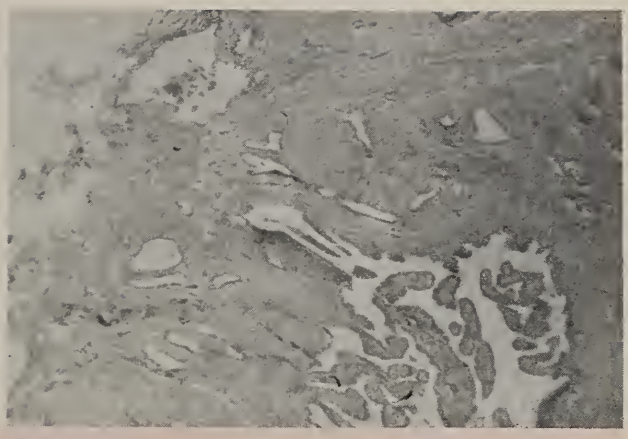


Fig. 2. Epithelial offshoots from the ampullary portion of the fallopian tube extending to the serosa.

Endosalpingiosis

A case report and discussion of etiology presented at the Minnesota State Society Obstetrical and Gynecological Meeting, St. Paul, Minnesota, November 7, 1959.

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ENDOSALPINGIOSIS is a disease that resembles endometriosis except that the aberrant glandular epithelium shows histological characteristics of tubal epithelium and lacks the cellular stroma associated with endometrium. Sampson[1] first used this term to describe extension of tubal epithelium from tubal stumps following salpingectomy. He showed that the new tubules perforated not only the muscularis of the tube but also the serosa. Involvement of the bowel was found in six patients and involvement of the ovary in four patients. In later studies Sampson[2] showed that aberrant tubal epithelium can be found in laparotomy scars after surgery involving the fallopian tubes.

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Goodall[3] published his experience with endometriosis and endosalpingiosis in a monograph published in 1943. He states that endosalpingiosis was always associated with a mild catarrhal type of subacute salpingitis. The inflammation was said to produce a marked tendency to hypertrophy of the tubal epithelium without closure of the fimbrial ends and without inflammatory infiltration of the muscular wall of the tube. Goodall found that endosalpingiosis rarely occurred in the form of implants as seen in endometriosis. He attributed this to the resistance of pelvic peritoneum to the spread of endosalpingiosis. When implants were found they were usually localized to the peritoneum in the immediate vicinity of the involved tube or ovary. Goodall,[3] Powers,[4] and Bianco[5] have described cases in which the surface of the ovary contains heterotopic endosalpingeal tissue. The descriptions of the gross appearance of the ovarian involvement varies from that of small implants surrounded by loose edematous stroma to that of solitary fibrous nodules in which glandular acini are found with the histological characteristics of tubal epithelium. The incidence of endosalpingiosis of the ovary is small. Bianco[5] found endometriosis in seventy-nine ovaries and endosalpingiosis in two of a total of 562 ovaries routinely examined following surgery.

Report of a Case

The following is a report of what is believed to be an unusual case of endosalpingiosis with involvement of the right ovary, right fallopian tube and pelvic peritoneum:

M.L. (30489), a woman, aged forty-six, para O, admitted October 14, 1958 to Mt. Sinai Hospital for pelvic laparotomy. A right adnexal cystic mass had been detected during hospitalization for pneumonia in June, 1958. The tumor had been asymptomatic until two weeks before admission when pelvic pressure was noted. Pelvic examination showed a right adnexal cystic mass, moveable, and 10 cm. in diameter. Pelvic laparotomy was performed October 15, 1958. A right ovarian cyst that appeared to be a simple cyst was found. A single nodular excrescence was seen near the mesentary of the ovary. Patches of small yellow-grey nodules were seen along the uterovesical peritoneal reflection and along the posterior surface of the uterus extending along the right cornual region and the posterior leaf of the right broad ligament. The nodules were discrete, about 1 to 2 mm. in diameter and did not extend deeper than the serosa.

A few nodules were removed for frozen section, but an exact diagnosis could not be given. Because well differentiated carcinoma was not ruled out, total hysterectomy and bilateral salpingo-oophorectomy were performed. The pathology report submitted by Steven Barron, M.D., pathologist at Mt. Sinai Hospital is abstracted as follows: The right ovarian cystic mass measures 11 cm. in length and 7 cm. in diameter. On cut section the lumen is multilocular. The lumenal surface is smooth with some areas of granularity. Sections of the ovarian cyst show a benign multilocular serous cystadenoma with nodules of endosalpingiosis. On the serosal surface of the uterus are numerous nodules which are fibrous and in many of these nodules small cysts are seen lined by columnar epithelium. In places small papillary projections extend into the lumen of the cysts. Some cells are ciliated. The cellular structure resembles that seen in the fallopian tube. Cysts of this type are found also on the fallopian tube and on the right ovary. No blood is seen within the cysts and no endometrial stroma surrounds the cysts. This appearance is typical for endosalpingiosis.

When the above report was received, the pathology department was asked to make multiple sections through the interstitial and isthmic portions of the right tube since the peritoneum in this area contained many clusters of nodules. Review of these sections showed many epithelial offshoots from the isthmic and proximal ampullary portions of the tube. (Figs. 1 and 2) These offshoots are seen to penetrate the muscular wall of the tube and to reach the serosal surface where the microscopic appearance of the small cysts are the same as seen elsewhere on the adjacent pelvic peritoneum (Fig. 3) and ovary. (Fig. 4)

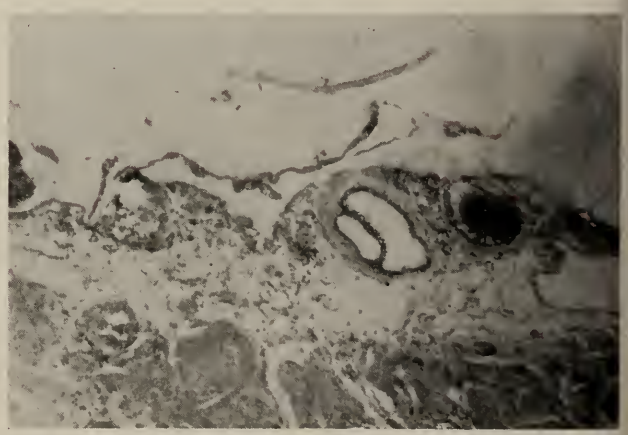


Fig. 3. Nodule of endosalpingiosis in serosa of uterus.



Fig. 4. Endosalpingeal cyst in hilum of the right ovary.

Discussion

Endosalpingiosis is a disease process resembling endometriosis except that it is less frequent and has much less tendency to spread to the surrounding tissues. The case presented raises some interesting questions: (1) Do the offshoots of tubal epithelium represent what is usually described as salpingitis isthmica nodosa? If so, the nodules on the isthmic portion of the tube are much smaller than usually described, but may fit the description of Novak and Novak[6] who state that the size of the nodules may be as small as buckshot. (2) Do the similar nodules disseminated to the surrounding pelvic peritoneum represent implantation of tubal epithelium that has perforated the wall of the tube? This is possible according to Sampson's theory and would also explain the involvement of the ovary. (3) Does the presence of serous cystadenoma of the right ovary as well as nodules of the endosalpingiosis support the theory of metaplasia of the germinal epithelium of the ovary and pelvic serosa? Robert Meyer, Emil Novak, and more recently Gardner, Greene, and Ranney[7] have supported this theory. However, since the demonstration of the implantation theory in monkeys by TeLinde and Scott[8] and of the viability of menstrual endometrium in humans by Ridley and Edwards,[9] Gardner *et al*[10] have published a letter to the editor of the *American Journal of Obstetrics and Gynecology* re-evaluating the histogenesis of endometriosis and admitting that retrograde menstruation may be one of the causes of endometriosis.

The treatment of endosalpingiosis is similar to that of endometriosis. Since the gross appearance of the lesion is quite variable, the diagnosis is usually made only after histological study. In the case reported above, a laparotomy was performed because of a right ovarian cyst. Since exact diagnosis could not be given on frozen section and because of the patient's age, total hysterectomy and bilateral salpingo-oophorectomy were performed. The descriptions of Sampson[1] led to the practice of performing cornual resection in order to avoid tubal stumps and subsequent endosalpingiosis or endometriosis. The type of endosalpingiosis found in this patient presents a different appearance than endometriosis because it does not invade or produce bloody cysts as in endometriosis externa. The findings in this case of endosalpingiosis would appear to support the implantation theory since the distribution of the nodules is centralized at the site of penetration of the tubular offshoots from the isthmic portion of the tube.

Summary

A brief review of endosalpingiosis is presented together with an unusual case of endosalpingiosis presenting involvement of the pelvic peritoneum, the serosa of the uterus, the right tube, and right ovary. The case raises certain theoretical questions related to the etiology of endometriosis and endosalpingiosis.

References

1. Sampson, J. A.: Am. J. Obst. & Gynec., 20:443-480, 1930.
2. Sampson, J. A.: Pathogenesis of postsalpingectomy endometriosis in laparotomy scars. Am. J. Obst. & Gynec., 50, 597-620, 1946.
3. Goodall, J. R.: A study of Endometriosis, Endosalpingiosis, Endocervicosis, and Peritoneo-ovarian Sclerosis. J. B. Lippincott Company, 1943.
4. Powers, E. G., and Hooker, O. M.: Salpingiosis, case report. Texas J. Med., 44:457-459 (Oct.) 1948.
5. Bianco, R.: Consideration of inclusion of tubal epithelium in the parenchyma of the ovary. Tumori, 42:609-615, 1956.
6. Novak and Novak: Gynecologic and Obstetric Pathology. W. B. Saunders Company, 1958.
7. Gardner, G. H., Greene, R. R., and Ranney, B.: Histogenesis of endometriosis. Obst. & Gynec., 1:615-639 (June) 1953.
8. TeLinde, R. W., and Scott, R. B.: Experimental endometriosis. Am. J. Obst. & Gynec., 60:1147-1166 (Nov.) 1950.
9. Ridley, J. H., and Edwards, I. K.: Am. J. Obst. & Gynec., 76:783-790, 1958.
10. Gardner, G. H., Greene, R. R., and Ranney, B.: Histogenesis of endometriosis (Re-evaluation). Am. J. Obst. & Gynec., 78:445, 1959.

Report of Case

Myocardial Infarction

with Normal Master's Test

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IT IS NOT infrequent that patients with symptoms of coronary insufficiency (angina pectoris) show normal electrocardiographic patterns. The rule, however, is that sometime in the course of the disease, electrocardiographic changes usually appear. If repeated or serial electrocardiograms persist in being normal, an exercise test often reveals coronary insufficiency (ischemic response).[1-3]

The following case report is an example of the infrequent case of coronary disease with normal resting electrocardiogram and negative exercise test (Master's two-step) twelve days before death, with confirmatory autopsy findings.

Report of a Case

B. G., a white man, aged sixty-four, was admitted to Mount Sinai Hospital Medical Service March 23, 1960. He complained of severe chest pain of one hour's duration following grocery shopping with his wife. He died twenty minutes after admission to the hospital.

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Electrocardiograms showed an acute postero-lateral wall infarct (Fig. 1) with terminal ventricular fibrillation. His past history revealed typical attacks of angina pectoris "with left anterior chest pain radiating to the left arm associated with exertion" during the past year; usually immediately relieved by nitroglycerin and by rest.

The patient was first seen at Mount Sinai Hospital Outpatient Department on November 4, 1959, with complaints of severe left chest pain radiating to the left arm and back with associated shortness of breath and sweating. Physical examination was essentially negative. An electrocardiogram showed normal pattern (Fig. 1). The patient was sent home with instructions to continue using nitroglycerin for chest pain.

The patient was again seen in the Outpatient Department on January 11, 1960, with complaints of impairment of vision, anterior chest pain, shortness of breath and intermittent claudication of the left leg. For the past twenty years there had been progressive impairment of vision and he had to change glasses every two to four years. The precordial chest pain had been recurrent for the past year. For about the same duration, the patient had pains in both legs, more on the left, noted especially when walking. The rest of the past history revealed that he had a right nephro-lithotomy in 1937, followed by nephrectomy for nephrolithiasis in 1940; syphilis treated in 1935 and 1940 with heavy metals, in 1954 with 30 million units of penicillin; recurrent duodenal ulcer treated in 1942, 1945, 1956, and 1958. In 1956 he was known as a treated case of tertiary syphilis. All of the above hospitalizations were at another facility in Minneapolis. A routine electrocardiogram on his 1956 hospitalization was reported as normal, as were two others taken in November and December, 1958.

The physical examination findings on January 11, 1960, revealed a well developed and well nourished male in no distress. The blood pressure was 170/80, pulse 82 per minute and regular. Examination of the eyes showed decreased vision in the left eye, an enlarged right pupil which did not react to light but had good reaction to accommodation. There was an early cataract in the left eye; nerve head changes suggestive of optic atrophy in

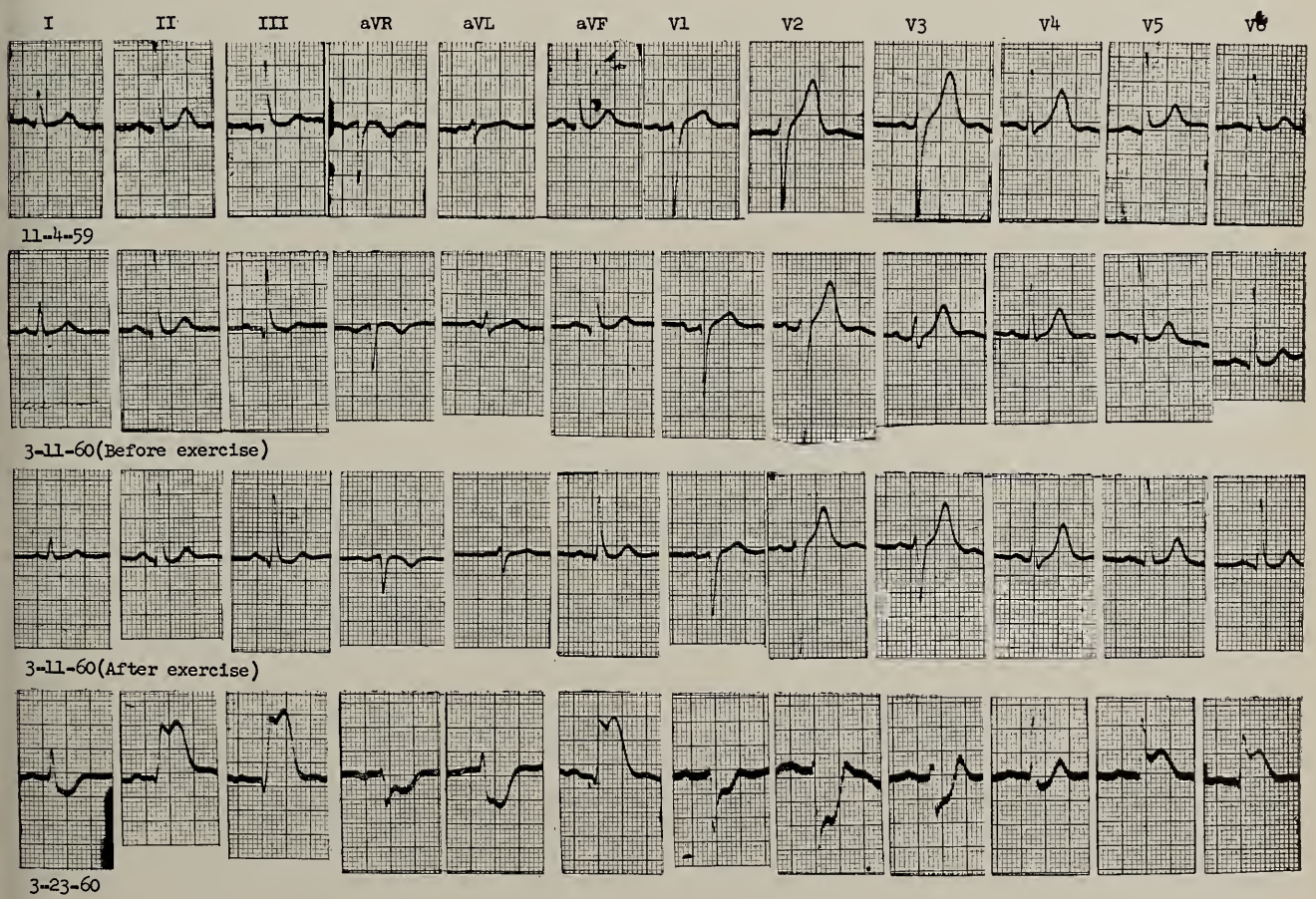


Fig. 1. Serial electrocardiogram of patient with angina pectoris: November 4, 1959, initial electrocardiogram. March 11, 1960, resting electrocardiogram before Master's two-step test. March 11, 1960, electrocardiogram after Master's two-step test. (All above electrocardiograms were interpreted as normal). March 23, 1960, electrocardiogram shows evidence of injury with pronounced S.T. elevations in L2-3-A.V.L., V5 and V6 with pronounced reciprocal S-T depression in L1-A.V.L., V1 to V3. Shortly after the ECG, ventricular fibrillation developed.

both eyes and constriction of the visual fields on both eyes. Examination of the fundi showed grade I retinal vessel changes. There was impaired hearing on the right side. Examination of the neck was negative. Chest was clear. The heart was not enlarged to percussion, the heart tones were slightly muffled. There was no murmur or rub heard. The abdomen was essentially negative. Rectal examination showed slight enlargement of the prostate. The extremities showed no edema. The femoral pulse on the left was weak and the distal pulses to the left leg were not appreciated. Oscillometry readings of the legs taken at the mid-thigh and mid-leg regions showed 1 to 2 units on the left leg and 3 units on the right leg. Deep tendon reflexes showed no gross abnormalities. Toe signs were absent.

The patient was followed as an outpatient, only, and had four subsequent visits. He continued to complain of pains in the chest and legs which at the time were considered unlikely to be the girdle and lightning pains of lues. The pains were considered characteristic of arteriosclerotic heart disease. On January 15, 1960, the hemaglobin was 15.8 gm. per cent, leukocytes 13,500 per cubic mm. with 70 per cent neutrophils, 25 per cent lymphocytes, 4 per cent eosinophils, 1 per cent basophils. An electrocardiogram was normal. Chest x-ray showed the heart to be of left ventricular configuration with aortic arch calcification. The lung fields were clear. The serum cholesterol was elevated to 280 mg. per cent. On February 22, 1960, a spinal tap revealed normal spinal fluid including pressure, cytology, serology, and chemistry. The patient was continued on nitroglycerin and given Niamid 25 mg. t.i.d. and Darvon compound. On his third visit on February 22, 1960, he complained of sharp chest pains on the right side. He described them as "needle pricks" noted on deep inspiration. However, the physical examination findings were unchanged. His subsequent visit was on March 7, 1960, and at this time he was free of pain. He appeared less depressed, probably the effect of Niamid. The blood pressure was 190/95 mm. Hg. The pulse was 72 per minute, regular. Chest was clear. The heart findings were unchanged. On March 9, 1960, an upper gastrointestinal series showed a duodenal bulb deformity suggestive of an active ulcer crater or the site of an old healed ulcer with residual excavation. Circulation time done on March 11, 1960, was 14 seconds. Vital capacity was 3 liters total and 2.4 liters in two seconds. He was put on convalescent ulcer diet and antacids.

On March 11, 1960, a Master's two-step test was performed and both resting and exercise electrocardiograms were normal (Fig. 1). The last visit to the Outpatient Department was on March 14, 1960, when the patient continued to complain of pains in the anterior chest and dyspnea. The blood pressure was recorded as 190/90, the pulse 82 per minute. The chest was clear and the heart was regular, with occasional premature ventricular beats. There was some epigastric tenderness noted. The femoral pulses were weak bilaterally. The rest of the examination was unchanged. The patient was continued on the same ulcer regime. He was given a return appointment ten days later which was March 24. However, he was admitted to the hospital on March 23, where he expired of myocardial infarction, as previously described.

Clinical Diagnosis: (1) Arteriosclerotic heart disease, angina pectoris, acute postero-lateral infarct (and ventricular fibrillation by electrocardiogram). (2) Arteriosclerosis obliterans of lower extremities. (3) Tertiary syphilis with argyll-Robertson pupil, bilateral optic atrophy. (4) Duodenal ulcer, probably inactive.

At autopsy, moderate cardiomegaly was present. There was marked narrowing and complete occlusion of the right coronary artery with thrombus and atheromatous material. There were scattered acute ischemic myocardial changes in the posterior interventricular septum. The left anterior descending coronary artery showed moderate narrowing and areas of hypoplasia with pinpoint lumen. There was minimal myocardial scarring. Microscopic sections of the myocardium and coronary arteries confirmed the above gross findings. There was marked aortic atherosclerosis. A healed prepyloric gastric ulcer was found.

Comment

In reviewing the case, in retrospect it is of interest that in spite of typical subjective symptoms of coronary insufficiency (angina pectoris), repeated electrocardiograms were normal, including an exercise test twelve days before the terminal myocardial infarction. Therefore, coronary arteriosclerosis confirmed by autopsy, sometimes cannot be demonstrated by the electrocardiogram.

Summary

A case of coronary artery disease with normal serial and resting electrocardiograms and negative Master's two-step test twelve days before death due to acute myocardial infarction is presented with confirmatory autopsy evidence.

Acknowledgment

Acknowledgment is made to Dr. Ernst Simonson, Professor, University of Minnesota, and consulting electrocardiologist at Mount Sinai Hospital, for his helpful suggestions and criticisms.

References

1. Master, A. M.: The two-step exercise electrocardiogram: A test for coronary insufficiency. Ann. Int. Med., 32:842-861 (May) 1950.
2. Master, A. M.: Two-step exercise electrocardiogram; follow-up investigation in patients with chest pain and normal resting EKG. J.A.M.A., 151:458-462, (Feb. 7) 1953.
3. Scherf, D., and Schaffer, A. I.: Electrocardiographic exercise test. Am. Heart J., 43:927-946 (June) 1952.

Report of Case

Duodenostomy

for difficult duodenal closure

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MUCH OF THE effort to develop new operations for management of duodenal ulcer resulted from a desire to avoid the technical difficulties associated with surgery of the duodenal stump. Subtotal gastrectomy, however, continues to remain the operation of choice of most surgeons for the operative treatment of duodenal ulcer. Secure closure of the duodenum in this operation is extremely difficult sometimes, and on, occasion, impossible. In the past, surgeons have used various techniques to make closure more satisfactory or to circumvent the problem, however no technique has proven universally satisfactory.

One of these techniques is duodenostomy or duodenal decompression. Several recent enthusiastic reports suggest that more surgeons are accepting duodenostomy occasionally as an accompanying procedure to gastrectomy, and are having low morbidity and mortality rates in connection with it. Two cases in which duodenostomy was used successfully are presented.

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Report of Cases

Case 1.—M. M., a man, aged forty-eight was admitted on January 10, 1958. He had had a known duodenal ulcer for the past one-and-a-half years which had been treated by diet. On the day prior to admission he began having tarry stools and on the day of admission, he had hematemesis.

Examination on admission revealed a blood pressure of 130/90, a pulse of 110, and the hemoglobin was 12.1 grams. There was mild epigastric tenderness.

A nasogastric tube was inserted and a continuous milk drip was started. The patient's condition remained unchanged until the following day. Active bleeding started again and his hemoglobin dropped to 9.1 grams while receiving five units of blood, and the decision to operate was made.

At surgery, examination of the duodenum revealed a previous anterior perforation which had been covered by omentum. The bleeding was coming from an open vessel in the base of a large posterior ulcer which penetrated into the head of the pancreas. The duodenum was considerably shortened and the common duct was seen entering the duodenum just distal to the ulcer.

The bleeding vessel was ligated and it was then apparent that the closure of the duodenum would be hazardous and insecure. A Billroth II, Hoffmeister, retrocolic, subtotal gastrectomy was done. The nasogastric tube was threaded into the afferent duodenal

loop, and a 16 F. straight rubber catheter (with two additional holes) was sutured into the duodenal stump. The duodenal stump was closed about the tube as well as possible. Absorbable sutures were used. The catheter was brought out to the skin through a separate stab wound. The tract from the duodenum to the skin was made long and was covered by omentum. In addition a penrose drain was placed near the duodenal stump and brought out to the skin. Postoperatively the nasogastric tube and the duodenostomy tube were connected to suction. The drainage from the two tubes on successive postoperative days were as follows:

	1	2	3	4	5	6	7	8	9	10	11	12
Nasogastric Tube	500	375	950	200								
Duodenostomy Tube	150	50	50	50	50	50	250	250	250	900	650	750

The nasogastric tube was removed on the fifth postoperative day and the patient started on oral feedings. The duodenostomy tube was clamped on the twelfth postoperative day and removed on the twenty-first day. The patient was discharged from the hospital on the sixteenth postoperative day. The penrose drain was gradually removed while the patient was in the hospital, and there was very little drainage. After removal of the duodenostomy tube the fistula drained slightly for twenty-four hours and then stopped.

Case 2.—C. C., a man, aged forty-nine, had had a known duodenal ulcer for the previous fifteen months. He had followed medical ulcer management carefully but would develop symptoms on the slightest relaxation of diet. During the month prior to admission he had frequent nausea and he vomited almost daily. There had been a moderate weight loss, and x-ray examination revealed gastritis, duodenitis and a small ulcer crater in the cap. The stomach was dilated, suggesting obstruction, but there was immediate emptying at the time of the examination.

Because the patient had failed to heal the ulcer on a satisfactory medical regimen, surgery was recommended. At operation it was found that the antrum, duodenum and head of the pancreas were involved in one inflammatory mass. A difficult duodenal closure was anticipated and alternate methods were considered. An attempt was made to free the antrum from the pancreas. A tissue plane was found and the antrum gently and slowly was freed from the pancreas by blunt dissection. When the dissection reached the pylorus the ulcer was entered and it was necessary to detach the stomach at the pylorus. Inspection showed the duodenum and pancreas to be one inflammatory mass and closure of the duodenal stump would be hazardous and insecure. A Billroth II, Hoffmeister, retrocolic subtotal gastrectomy was done. The nasogastric tube was threaded into the afferent loop. The duodenal stump was closed around a No. 16 straight rubber catheter with absorbable sutures. A long tract was made to the skin and covered with omentum. The duodenal catheter was brought out through a separate stab wound; no penrose drain was inserted. The drainage from the tubes postoperatively were as follows:

	1	2	3	4	5	6	7	8	9	10	11	12
Nasogastric Tube	2200	500	1500	1100								
Duodenal Tube	125	200	225	?	500	2025	1200	1200	0			

The naso-gastric tube was removed on the fourth day and feeding started on the fifth day. The duodenal tube was clamped on the eighth postoperative day and removed on the thirteenth day. After the duodenal tube was clamped there was a moderate amount of drainage on the skin around the tube for about a week. A very slight drainage persisted for three more weeks and then stopped. The patient was discharged on the sixteenth postoperative day.

Both patients have remained well and free of symptoms since surgery.

Discussion

Duodenostomy or duodenal decompression is not a new procedure. However it was not until fluid and electrolyte replacement therapy could be accurately managed that it became practical. In the cases presented the duodenal drainage was never a problem, but others report that the drainage may be considerable. Rodkey and Welch[5] recommend the routine use of a feeding jejunostomy tube. If the duodenal drainage is large in amount they connect the duodenal tube to the jejunostomy tube.

In addition to proper fluid and electrolyte replacement, other details must be followed to avoid complications. It is suggested that large catheters or Foley catheters not be used. Absorbable sutures should be used and a tight closure of the duodenum around the catheter be made.

References

1. Welch, C. E., and Rodkey, G. V.: Method of management of duodenal stump after gastrectomy. Surg., Gynec. & Obst., 98:376, 1954.
2. Chester, S. T., and Bell, H. G.: Management of duodenal stump in gastric resection for technically difficult duodenal ulcer. West. J. Surg., 63:701, 1955.
3. Caudell, W. S., Garrison, R. L., and Lee, C. M., Jr.: Use and complications of catheter duodenostomy in gastric resection. Surg., Gynec. & Obst., 100: 506, 1955.
4. McEachern, C. G., Sullivan, R. E., and Arata, J. E.: Duodenostomy: Method of management of difficult duodenal stump in certain cases of partial gastrectomy for duodenal ulcer. Arch. Surg., 72: 942, 1956.
5. Rodkey, G. V., and Welch, C. E.: Duodenal decompression in gastrectomy. New England J. Med., 262:498, 1960.

Medicine and its Practitioners in Mower County Prior to 1900

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William Carpron, a graduate of the medical department of the University of Michigan, visited Dexter and Adams in the summer of 1891. He later moved to Wells, Faribault County.

Orson A. Case, an eclectic physician, active in local eclectic medical societies in due time, practiced in various communities in southern Minnesota, probably beginning in the late eighteen fifties or the early sixties. He is said to have been the first physician, date not known, in the village of Sanborn, Redwood County; he again practiced in Sanborn in the period 1886-1893. By 1864, presumably after his first departure from Sanborn, he was practicing in Preston, Fillmore County, and apparently was an active member of the community. Thereafter he was in various other villages of that county. (See medical history of Fillmore County.) In 1870, he was graduated from the Bennett College of Eclectic Medicine and Surgery of Chicago.

By 1877, this practitioner was in Grand Meadow, Mower County, "a physician of fair ability, a graduate," but went elsewhere in the following year. Subsequently he was again in Chatfield, for in the official register of physicians of the state of 1883-1890 he was listed as in that village, practicing under the Affidavit Law of 1887. In a later edition of the register, he was enrolled, without address, as the possessor of an exemption certificate. His name did not appear in the first issue, in 1906, of the directory of the American Medical Association.

Willis Frederick Cobb (1847-1932) provides an excellent example of the finest type of country doctor in the pioneer days of Minnesota and Iowa. His career spanned fifty-eight years of rural medicine at the border of those two states. He lived at Mona, Mitchell County, Iowa, from 1874 until 1895, when he moved to Lyle, Mower County, Minnesota, one mile north of the interstate line.

Willis F. Cobb was born in Limington, Maine June 14, 1847, the only son of Joel Cobb and Abigail O'Brien Ellis Cobb. The family lived for a time in Cornish, Maine, before moving to Rutland, Wisconsin. In Wisconsin, Willis Cobb attended district school, the Evansville Academy and the University of Wisconsin, from which he was graduated with the degree of bachelor of philosophy in 1870. He was graduated from the Chicago Medical College in 1874, and a month later began practice in Mona, Iowa. On April 30, 1871, he was married to Abbie C. Mason, of Rutland, Wisconsin; to this union were born four daughters—Edith A., Edna M., Ethel M., and Enid H.

In his early years of practice, Dr. Cobb made his country calls by horse and buggy in the summer, on horseback in the spring mud, and by sleigh in the winter snow. He used sleigh bells of distinctive tone which the farmers all recognized and by which they often could locate him in case of emergency. The sound of the bells was awaited eagerly by the patient, as well as by the doctor's wife, who on hearing it could know that her husband was returning home safely.

Dr. Cobb's first automobile was a red, chain-drive Buick, with which he had more than usual trouble since it did not respond to oral commands. More than one farmer lost his front gate when the little red Buick failed to heed a loud and desperate "Whoa." The doctor's family once was startled when a late supper was delayed further because the stubborn Buick crashed through the front doors and the back wall of the barn while the good doctor pleaded ever more loudly, "Whoa, whoa, whoa."

Dr. Cobb was a deeply religious man, never forgetting his religion and his God. He was deacon of the Congregational Church and superintendent of the Sunday School at Lyle. Many years after it happened, a revealing incident was reported to a member of Dr. Cobb's family. The doctor was at the bedside of a patient, and all his medical skill had been called upon without avail. The patient, in his desperation, asked, "Isn't there anything more you can do, Doc?" "Yes," the doctor replied, "there is one more thing I can do." And reverently he knelt beside the bed and offered up a prayer for his patient. The man lived. Surely the patient and the doctor must both have had abiding faith. "Such a procedure by a modern doctor would doubtless scare the patient to death."

Dr. Cobb had other resources also which he used in stubborn and difficult cases. He knew his patients and had a good understanding of psychology. He became convinced that one of his women patients was "enjoying poor health." A present-day general practitioner probably would refer such a patient to the State Mental Health Clinic, but Dr. Cobb discussed the situation with the husband, and then told the lady that he had decided to try a new treatment: He was sure that the only thing that would relieve her was a "corncob sweat." So he heated corncobs in an old-fashioned boiler over the kitchen stove and then packed them around her as she lay in bed. In a few hours, she certainly was better and felt able to be up. After that, whenever she showed a desire to take to her bed because of some vague complaint, the mere mention of a corncob sweat was enough to get her up on her feet.

Dr. Cobb was a willing worker in community affairs. Politically, he was a Republican and he served the village of Lyle as mayor, justice of the peace, and president of the school board. In Mona, Iowa, he operated a drugstore, and in Lyle was president of the telephone company. He always endeavored to keep up-to-date in his medical knowledge, by reading of the literature and by active participation in the affairs of his county medical society. He served as president of the Mitchell County (Iowa) Medical Society and of the Mower County Medical Society. Of the latter group he was also an organizer, a charter member and vice-president. He was a member of the state medical society, and of other smaller professional groups. He was interested in the organization of St. Olaf Hospital in Austin and was one of the first physicians to make use of its facilities in his practice. He served as local surgeon for the Illinois Central Railroad for thirty-five years, and was examining surgeon for many insurance companies.

Dr. Cobb was a Mason, a member of the Royal Arch, a Knight of Pythias, and a Woodman. In addition to all his professional and civic duties, he superintended the business of his farms, raised chickens, and kept a garden. He found relaxation in hunting and fishing, and playing checkers and chess.

In 1900, Dr. Cobb went into partial retirement and moved to Northfield, Minnesota, but a year-and-a-half later returned to Lyle to complete his life among his old friends. Only during the last few years of his life did he completely give up his practice and attempt to take life more easily. He died June 3, 1932. To quote from his obituary: "The reaction of this slower living and the approach of Old Age weakened him and he passed silently to the beyond." His wife survived him with two daughters, Edith, Mrs. L. O. Olson, of Northfield, Minnesota, and Edna, Mrs. N. C. Putnam, of Lyle, Minnesota. There are four grandchildren: Willis C. Olson, of Cameron, Wisconsin, Ruth Putnam, of Cedar Rapids, Iowa, Grant Putnam, of St. Paul, Minnesota, and Audrey Mae Hueken, of Minneapolis. In 1957, only one member of the immediate family was living, Mrs. Putnam, of Lyle.

Such was the career of an outstanding pioneer physician. Certainly not an "average" doctor, a much better man than the "typical country doctor," and surely a man who left a record of conscientious service, hard work, devotion to high ideals, and an abiding faith.

William Coburn practiced medicine in Austin in the nineties. At one time, about 1898, it is said Dr. W. V. Hanscom was associated with him in practice.

J. L. Conner practiced in Grand Meadow in 1894. He committed suicide in Minneapolis in 1899 because of ill health.

Hiram L. Coon was the third physician to settle in Austin and the fourth in Mower County. Born August 25, 1828, in Grafton, New York, he early was trained in farming. When he was twelve years old he came West with his family to Milton, Rock County, Wisconsin, where he attended common school and Milton Academy, and probably began the study of medicine. On graduation from Rush Medical College in 1855 (sometimes given 1854), he started medical practice in Rutland, Dane County, Wisconsin. In 1855 he was married to Miss Sarah Morton, and in 1856 came with his wife to Austin.

In Austin and locality, Dr. Coon carried on the strenuous practice of the time. In 1859 appeared the first newspaper records of county aid to the poor; in February of that year Dr. Coon and Dr. Orlenzer Allen presented bills to the county commissioners for medical attendance on the needy. In 1861, Dr. Coon removed to Northfield, Rice County, and there continued to practice medicine. He was licensed in Minnesota on October 11, 1883. His death occurred in Northfield in 1887. Dr. Coon was a member of the state medical society and of the national medical association.

J. W. Corbitt, an allopath, a graduate of the Bellevue Medical College, New York, came from Michigan to Mower County in the autumn of 1868 and settled in Le Roy. Well educated and informed, he had had considerable experience in medical practice although still a young man, and was a good physician. He remained in practice in Le Roy most of the time until his death from consumption in February, 1881.

— **Cormack** (sometimes Cormick), according to the history of Mower County of 1884, practiced in Dexter for a year, then moved to Dakota. In the medical history of Scott and Carver Counties, of the present series of articles, it is stated that "P. L. Cormack opened an office in Jordan, Scott County, in September, 1878. In the following March he moved with his family to Dexter, Mower County, where he managed a drugstore in connection with his practice of medicine." Further record of Dr. Cormack has not been observed.

Annette Corneveaux (Finn), for nine years a successful practitioner in Austin in the eighties and nineties, received a diploma from the Physio-Medical School in Indianapolis in 1887. Later she took special courses of study and did hospital work in Chicago for a year. In 1895 she was married to Dr. J. J. Finn, a former classmate. Her death occurred a few months later (February, 1896) in Austin, from typhoid fever and pneumonia. She was about thirty-six years of age at the time.

— **Cunningham** practiced in Lyle in 1896.

Gustav William Dahlquist (1874-1950), the son of Alexander Dahlquist and Wilhelmina Ecklund Dahlquist, was a graduate of the College of Medicine and Surgery, University of Minnesota, in 1893. From that year to 1898, it appears, with the exception of a period in Hayward, Wisconsin, in 1895, he practiced medicine in Adams, Mower County, Minnesota. From Adams he removed in 1898 to Cokato, Wright County. He was then a member of the Minnesota State Medical Society and presumably of county medical societies. On January 15, 1903, aged twenty-nine years and resident in Bottineau County, North Dakota, he was licensed to practice in that state. In 1904 he was practicing in Dassell, Meeker County, Minnesota. From 1907 to 1917 he practiced at Lancaster, Kittson County.

In 1917, according to an obituary, he enlisted in the United States Army; in his death certificate (1950) it was stated that he was in the armed forces from August 5, 1918, to December 4, 1918. On completion of his military service he returned to Lancaster, and a few years later removed to Fargo, North Dakota, where for ten years he was on the medical staff of the Veterans Administration. From Fargo he returned to Lancaster in the early nineteen thirties, and a few years afterward, not later than 1940, he retired from practice. Thereafter he lived in St. Paul, and in Burke, Idaho, until he began residence at the Minnesota Soldiers' Home in Minneapolis.

Dr. Dahlquist died on October 25, 1950, at the Minnesota Soldiers' Home, from hypostatic pneumonia. He had suffered from generalized arteriosclerosis and, shortly before his death, from right-sided hemiplegia. Burial was in the National Cemetery. Dr. Dahlquist was survived by six children. His wife, Elizabeth G. Duncan Dahlquist, had died the preceding winter.

Francis Emerson Daigneau (1862-1937), from 1892 until his death, was a leading citizen and physician of Austin, Mower County.

Born October 1, 1862, at Hubbardton, near Rutland, Vermont, F. Emerson Daigneau was the son of John G. Daigneau and Henrietta Dikeman Daigneau. John G. Daigneau, who was a veteran of the Civil War, was the son of Michel Daigneau, who came from France to Canada.

F. Emerson Daigneau received his preliminary education in the village school of Hubbardton and at Newton Academy, in Shorham, Vermont. Thereafter he studied at the Séminaire de Saint-Hyacinthe, in Saint Hyacinthe, Quebec, Canada, and next, making his way by his own efforts, at a medical institution in New York City. On completion of the medical course, he enrolled at the University of Vermont, from which he was graduated in medicine in 1886 with the highest honors in his class. He received the first prize given by the faculty for "general proficiency in examinations."

Dr. Daigneau first practiced medicine, for a short time in 1887, in Somersworth, New Hampshire, before coming to St. Paul, where he practiced in the sections of Merriam Park and St. Anthony. He was licensed in Minnesota on October 28, 1887, receiving certificate No. 7-B (R).

He was married March 31, 1888, to Alice Merrick of Somersworth, New Hampshire. Two of the six children of Dr. and Mrs. Daigneau were born in St. Paul. In 1892, Dr. Daigneau came with his family to Austin, where for a time he was in partnership with Dr. William L. Hollister. In his first professional cards, he announced that he gave especial attention to the electrical treatment (then new) of the diseases of women, and to eye, ear, nose, and throat work; in those years the physician often fitted eyeglasses. For many years, Dr. Daigneau carried a heavy general practice, but after 1915 he gradually limited his professional activities to office consultation and, finally, to ophthalmology. He encouraged the organization of St. Olaf Hospital and availed himself of its facilities in his practice, was an organizer of the Mower County Medical Society and a member of the Minnesota State Medical Association and the American Medical Association.

An intellectual man of keen wit and kindly humor, Dr. Daigneau served his community well. He was for many years a member of the board of trustees of the public library of Austin. He possessed an unusually fine private library, both general and medical, and he is remembered for his diversified interest in scientific knowledge. One of his hobbies was the study of mushrooms; his friends recall that he gathered and classified the fungi of this order that appeared on the greens of the local golf course. He was interested in golf when the game was practically unknown in Austin, and to his efforts the organization of the golf club of Austin was due. He was instrumental also in founding the Cosmos Club of the city and was a member of the Royal Arcanum Society.

When Dr. Daigneau died, December 10, 1937, he was survived by his wife and by six children: Donald V. and Ralph H., of Austin; Kenneth S., of New York; Maurice, of Cleveland; Marcia L. (Mrs. P. H. MacFarlane), of Chisholm; and Elizabeth A. (Mrs. T. E. Linnihan), of Everly, Iowa. Mrs. F. E. Daigneau died March 8, 1952, and Ralph H. Daigneau, September 18, 1955. In 1957 there were living of the family, Donald V. Daigneau, well known in business enterprise in Austin, and his two sisters, Mrs. MacFarlane and Mrs. Linnihan.

F. A. Davis came to Austin about 1871, remained a year or so, and removed to Lenox, Massachusetts. Much later another Dr. F. A. Davis, with whom the former sometimes has been confused, was licensed in Minnesota, in 1903, and practiced in Freeborn, Freeborn County.

F. C. Davy in the spring of 1880 came to Le Roy and became a partner of Dr. G. M. Allsdurff. After about one year the partnership was dissolved and Dr. Davy left for Davenport, Iowa, where he became chemist in a glucose factory. Afterward he went to New York, where he received an appointment as a railway surgeon. In 1884 he was a chemist in a salt refinery in New York.

— **Dillon,** formerly of Minneapolis General Hospital and the Massachusetts General Hospital, opened an office in Austin in 1895. Reference to official medical directories indicates that the only Dr. Dillon in the state in that period was a Dr. Phillip F. Dillon (R) of Minneapolis, a graduate in medicine in 1886.

William M. Dodd (1853-1883) was for a short time in Austin and later in Brownsdale in the early eighties. Born in Cortland County, New York, December 20, 1853, he was the eldest of the three children of Isaac Dodd and Margaret Johnston Dodd, who in the spring of 1855 opened a farm in Kalmar Township, Olmsted County. In 1862 Isaac Dodd was married to Helen Ranson, a relative of the Ranson family of Dodge County, three members of which have been well-known members of the medical profession of Minnesota.

William Dodd, after attending the district school near his home, studied academic branches at Niles Academy in Rochester and medicine under Dr. Hector Galloway of that city, preliminary to formal medical training. In March, 1880 he was graduated from the Chicago Medical College, and for the next three months practiced medicine in Byron as locum tenens for Dr. Isaac Hall Orcutt. From Byron Dr. Dodd came to Austin and soon after to Brownsdale. He carried on an extensive and successful practice in both Mower and Freeborn Counties until his health failed. An attack of lung fever in August, 1882, was followed by tuberculosis. In January, 1883, with his wife, Nona Hitchcock Dodd, to whom he had been married at Milan, Minnesota in July, 1880, he went to Napa City, California, the home of his wife's parents, seeking a beneficial climate. The only child of the young couple, a little boy, died en route west. Dr. Dodd died at Napa City on April 20, 1883.

E. Dudley has been mentioned as having been in Mower County, and possibly in Freeborn County, in 1887. Information about him has not been available.

William Edwards arrived in Taopi, Mower County, about 1877 and is said to have practiced medicine there until about 1881, when he removed to Dodgeville, Wisconsin.

J. W. Eighmy (sometimes misprinted Eryhmy) was an eclectic practitioner of medicine and surgery in several different villages of Fillmore County for five or six years before he settled in Brownsdale, Mower County in 1871.

In 1868 he was in Fillmore village in partnership with H. D. Dain in a thriving drugstore. On August 23, 1868 he was married to Mary J. Priest, the daughter of a pioneer farmer in Harmony Township. In 1869 Dr. Eighmy was one of the founders and the first secretary of the Fillmore County Eclectic Medical Society.

In Brownsdale he practiced medicine for a few years and placed on the local market "Dr. Eighmy's Magic Cure for Rattlesnake Bites," and all other bites, of his own compounding, at one dollar a bottle. In the spring of 1874 he left for California, where he died a few years later.

Ellen M. Backus-Fairbanks was born Ellen M. Backus in Royalton, Windsor County, Vermont, in 1834. She was married to Alonzo Fairbanks in Vermont and came with her husband to La Salle County, Illinois, in 1855, thence to Otranto, Mitchell County, Iowa, and in 1861 (sometimes given 1859) to Austin, Mower County.

For some years Mrs. Fairbanks had been interested in the profession of medicine, and in Austin she studied with Dr. Samuel P. Thornhill (1821-1879; in Austin from 1869) as preceptor for a year or more before entering medical college. In 1881 she was graduated from the Woman's Hospital Medical College of Chicago. The Mower County history of 1884 contains the statement: "Her professional career has established the fact that women in the school of medicine may successfully compete with the opposite sex." Armstrong noted that she was a popular physician and had a fair-sized practice in Mower County.

Dr. Fairbanks received Minnesota license No. 529 (R) on December 31, 1883. She was admitted to membership in the Minnesota State Medical Society in 1885. Her death occurred in 1887. Later, Alonzo Fairbanks was a resident of Blooming Prairie, Steele County.

Charles Edward Fawcett, newly graduated in medicine from Northwestern University, practiced medicine three months in Austin in 1893 before settling perma-

nently in Stewartville, Olmsted County.

Charles E. Fawcett was born on October 13, 1869, a son of John Henry Preston Fawcett and Emily J. Wooldridge Fawcett, both of whom were members of early pioneer families in southern Minnesota. Charles Fawcett was educated at the public schools of Marion, at Darling's Business College, Rochester, and at the Winona State Teachers College. After teaching rural schools for two years, he began the study of medicine with Dr. Horace H. Witherstine, of Rochester, in the summer of 1891; that autumn he matriculated at Northwestern University, from which he was graduated on April 24, 1893.

After his initial practice in Austin, Dr. Fawcett took up residence in Stewartville, where he was in active practice until his death on December 8, 1939. A detailed biographical sketch of this honored citizen and physician appeared in a history of medicine in Olmsted County in this series.

Fannie Gray Kimball Fiester (1866-1938) was in practice in Austin from 1893 to the day of her death.

Born May 6, 1866 in West Randolph, Vermont, Fannie G. Kimball received her early education in the city of her birth. She was graduated in 1891 from the Woman's Medical College of Northwestern University and in 1893 received the degree of doctor of medicine from the Hahnemann Medical College in Chicago. She served her internship in the Iowa State Hospital at Independence, Iowa, and immediately afterward began medical practice in Austin. Her marriage to Mr. Fiester, a grocer, took place in Austin.

Dr. Fiester (then Kimball) took an active interest in the organization of St. Olaf Hospital and was one of the first physicians to utilize the facilities of the hospital in her practice. She was one of the early members of the Mower County Medical Society which was founded a few years later.

For a year or more around the turn of the century Dr. Fiester took into partnership in practice Dr. Emma Adeline Keeney, who came to Austin at that time from Spring Valley. Dr. Keeney left Austin about 1903, it is believed.

Dr. Fiester's death occurred suddenly on May 6, 1938.

A. A. Finch may have practiced medicine in Mower County in the nineties, but it seems more probable that he was in Freeborn County, or Steele County, or both. In the history of medical practice in Dakota County he is mentioned as having been in Blooming Prairie, Steele County in 1896. He was present at a meeting of the Southern Minnesota Medical Association in 1898.

J. J. Finn practiced in Austin in 1895 and 1896. In 1895 he was married, in Austin to Dr. Annette Corneveaux of that place, a former classmate. As stated previously, Dr. Corneveaux Finn died in February, 1896.

— Forward (or Faward?) came to Brownsdale in 1884. His stay there probably was brief. It is believed that he was the "Dr. Faward" mentioned as having been in Brownsdale at about that period.

William A. Frazer (sometimes seen Fraser) was for many years, beginning in the period 1885-1888, a well-liked physician and surgeon in Lyle, Mower County.

Born in Bedford, Bedford County, Pennsylvania, August 5, 1850, William A. Frazer was a son of William Frazer and Hannah Davis Frazer. In 1861 he accompanied his parents to Illinois and in 1868 to Arkansas. His mother died in 1878, his father, in 1885.

After obtaining his early education, W. A. Frazer entered the University of Kansas City, Missouri, from which he was graduated in medicine in 1886. One account states that he first came to Lyle in 1885, but soon left to continue his medical training; another, that he settled permanently in Lyle in 1888. It appears that he first practiced medicine in Blooming Grove, Lynn County, Kansas, before coming to Minnesota. In 1890, 1896, and 1900 he took graduate medical courses in Chicago.

Dr. Frazer received Minnesota license No. 1362 (R) on April 15, 1887. He was one of the founders of the Mower County Medical Society, once its president, and was a member of the Minnesota State Medical Association and the American Medical Association. In Lyle he served as justice of the peace and as village health officer. He was a member of various fraternal organizations, among them the

Masons, the Knights of Pythias, and the Modern Brotherhood of America. Politically he was a Prohibitionist. Born a Quaker, in Minnesota he attended the Congregational Church.

On February 3, 1875, William A. Frazer was married to Viola C. Johnson, of Hindsville, Arkansas. Dr. and Mrs. Frazer had six children, four of whom were living in 1911. In that year May was a student at Oxford University, England; Ray was in Minneapolis; J. D., in the insurance business in Lyle; and William M., a student at the University of Minnesota.

After leaving Lyle, date not known, it is said that Dr. Frazer practiced medicine in Minneapolis.

J. P. Freeman was born in Freeborn County, Minnesota, in 1876, and in due course was graduated in medicine from the University of Illinois. He is said to have practiced in Grand Meadow, Mower County. There is record that he practiced at Emmons, Freeborn County, and also at Glenville, where he had a drugstore. In 1910 he was listed as a member of the Freeborn County Medical Society. In 1927 he settled in Albert Lea.

Willard Wheeler Freeman practiced medicine in Minnesota from 1878 to 1904, the last five years in Grand Meadow, Mower County. Recent information to Guthrey from members of Dr. Freeman's family serves to correct and enlarge the brief account that was given in the medical history of Houston County.

Willard W. Freeman was born October 4, 1839, at Albion, Maine, where he spent most of his childhood. At the beginning of the Civil War he enlisted in the Union Army, but because of a physical disability could not be accepted, to his keen regret. After completing his preliminary education he enrolled at Dartmouth College, Hanover, New Hampshire, from which he was graduated with highest honors in 1864. Thereafter he studied law, was admitted to the bar, and entered the law office of Judge Drummond in St. Louis, Missouri. He also taught school, and for a few years (1868-1872) was president of Whitman College at Walla Walla, Washington.

He was married in 1873 at Portland, Oregon to Nancy Nichols of Taunton, Massachusetts. There were three children of the marriage, two daughters and a son.

In 1877 Willard W. Freeman was graduated from medical college in Philadelphia. In Polk's directory for 1904, he is listed as a graduate (1877) from the University of Medicine and Surgery (Eclectic), Philadelphia; elsewhere, as from the University of Pennsylvania.

Dr. Freeman began his initial medical practice in 1878, in Benson, Swift County, Minnesota, and remained there about five years. In 1883 he removed to Anoka, Anoka County, which for ten years was the family home and the scene of his practice. On December 31, 1883, under the Medical Practice Act, he received certificate No. 591-1 (R), "license by examination." In 1893 Dr. Freeman, with his family, settled in Caledonia, Houston County. His offices were over Belden's Drugstore. In this village Dr. and Mrs. Freeman recognized the need for a public library, and "with 300 donated books opened a library in the old fire hall on Main Street, a meager thing but a start."

In 1898 Dr. Freeman sold his practice in Caledonia to Dr. Da Costa Rhines and moved to Grand Meadow, Mower County, where he had bought the practice of Dr. D. F. O'Connor, who had been in the village since about 1893. Here his offices were over Greening's Bank. In the years in Grand Meadow Dr. Freeman was physician and surgeon for the Chicago, Milwaukee and St. Paul Railway Company. In 1900 he was admitted to membership in the Minnesota State Medical Society, and, subsequently, he was one of the organizers of the Mower County Medical Society, at a meeting in Austin.

In 1904 Dr. Freeman and his family left Minnesota for Colorado where, in Eads, he served as county physician and carried on private practice until his death. He died April 13, 1912 at Fowler, Colorado after a short illness, at the age of seventy-three. He is buried at Olney Springs, Colorado. Mrs. Freeman died on February 12, 1923, at Denver, Colorado.

In 1957 there were living, of Dr. Freeman's family, his son Eliot N. Freeman, an attorney-at-law in Denver, Colorado; and two daughters, Faith (Mrs. Melvin Gipe), of Salinas, California, and Mary (Mrs. Clinton D. Scott), of Glendora, California.

A grandson, Eliot N. Freeman, is a physician in Whittier, California. Dr. W. W. Freeman's children recalled vividly their father's accounts of the hardships of the early physicians: bad weather, bad or no roads, and paucity of conveniences and of professional equipment.

J. V. Frost, as noted by Armstrong, practiced medicine in Lyle for a few months in 1875. A Dr. J. V. Frost, probably the same man, was in Concord, Dodge County, in January, 1884. He announced that he specialized in chronic diseases, and he gave lectures to the public on mesmerism, marriage, and various other subjects. When it appeared that he could not pay the rent for the lecture hall, he left town abruptly.

E. S. Gibbs, according to one source, practiced medicine in Le Roy in 1869. If so, he went on at once into Freeborn County. There is record that E. S. Gibbs studied medicine with Dr. A. C. Wedge of Albert Lea, was graduated in 1869 from the Cleveland Medical College, was admitted to membership in the Minnesota State Medical Society in 1870, and practiced medicine in Geneva, Freeborn County, for a few years.

Otis W. Gibson, son of Otis L. Gibson, an eminent physician of the town, was born at Wellsboro, Tioga County, Pennsylvania in 1839. He was graduated from the College of Physicians and Surgeons, New York City, in 1860, and practiced in Wellsboro the following year. In 1861 he enlisted in the United States Navy as assistant surgeon and was assigned to the United States Warship *Alabama,* of the South Atlantic and West Indies Squadron. When in 1863 he left the Navy and became an assistant surgeon in the United States Army, he was stationed at Bedloe's Island in New York Harbor where he was virtually in charge of the medical department of a camp for convalescents. Subsequently he was appointed post surgeon at Fort Hamilton and Fort Lafayette, also in New York Harbor, where he won the respect and regard of superiors and subordinates. Toward the end of 1866 he left the service, and in February, 1867, he came to Austin, Minnesota, where with the exception of one year he spent the remainder of his life.

Under the Medical Practice Act of 1883 Dr. Gibson held certificate No. 868 (R), dated April 16, 1884. He served as a state senator in 1887-1889. In 1888 he was elected mayor of Austin, an office which he held for three consecutive terms, during which he greatly furthered civic progress. For many years he was a surgeon for the Chicago, Milwaukee and St. Paul Railway Company, and just before his death he received a similar appointment from the Chicago Great Western Railway Company. He was a member of the local board of the United States Bureau of Pensions. examining surgeon for the New York Life Insurance Company, and post surgeon of the McIntyre Post of the Grand Army of the Republic, of Austin. He also served many years as county physician.

Dr. Gibson was married to Miss C. D. Farmer, a native of New York. About 1878 Dr. and Mrs. Gibson lost two little sons, Louis and Frank, who died tragically from diphtheria during an epidemic. In 1884, as stated in the county history of that year, there were two children living, a son and a daughter.

Otis W. Gibson died in Austin in January, 1896, of Bright's disease. This able pioneer physician and surgeon, loyal in all relationships, made many friends. He is remembered as being especially kind to the poor, giving them much gratuitous service, and to old soldiers and members of their families.

Charles M. Gordon (sometimes seen M. C. Gordon) came to Lyle from Montreal in 1881 and practiced there for a short time. Reputedly, he was of the "old school." His professional card announced him as a member of the College of Physicians and Surgeons of Ontario and Quebec and a graduate of McGill University, Montreal.

George W. Gray (1851-1914), a prominent member of the profession locally, came to Mower County in 1877. One writer expressed the belief that he first practiced in Taopi. Dr. Gray himself, however, wrote as follows, for inclusion in the history of Mower County that was published in 1884: "Corrected by G. W. Gray, M.D.: G. W. Gray was born in 1851 of English parentage. He came to Minnesota in 1877 and located at Grand Meadow, where he practiced in his profession until 1883, when he came to Brownsdale, where he is continuing the practice of medicine and surgery. He is a regular practitioner and a successful physician. Dr. Gray was married at Grand Meadow, October 1, 1879, to Miss Viola

F. Sebring. He is a member of the Grand Meadow A. F. & A. M. Society, and served as police justice while a resident of Grand Meadow, and is a staunch Republican."

Dr. Gray practiced in Minnesota under exemption certificate No. 65-B, dated October 11, 1883, "no report" as to medical school. He often served as a county physician, was one of the first members of the Mower County Medical Society, and a member of the Minnesota State Medical Association. In 1906, he was still in practice in Brownsdale. He may have been in Austin later, and in the last years of his life he made his home in Minneapolis, according to reports of his death. In the *Journal-Lancet* of December 15, 1914, it was stated that Dr. Gray, of Brownsdale and Austin, died "last week." In a similar account in the *Journal of the American Medical Association* of February 13, 1915, it was reported that Dr. Gray had died recently at his home in Minneapolis.

Thomas Edmund Hall, a graduate of Rush Medical College in 1875, came in that year from Preston, Fillmore County, to Brownsdale and to Austin. After a short time he left Mower County.

He was born at Preston in 1854, the son of Mr. and Mrs. Thomas Hall, who were among the earliest settlers of Fillmore County. He began medical practice in Lanesboro, and in the next twenty years practiced in many different towns in various counties of southern Minnesota: Fillmore and Mower, as stated, Martin, Wabasha, Goodhue, Winona and Houston. He held state certificate No. 781 (R), issued on January 28, 1884. In 1886 Dr. Hall returned to Lanesboro, probably from Dresbach, Winona County, and remained until about 1909, when he moved to La Crescent, Houston County. In 1910 he was living and practicing in La Crosse, Wisconsin, where he died on May 5, 1912. (For detailed account, see medical history of Fillmore County.)

A **Dr. Hanson** has been mentioned as being in Austin in the middle nineties. It is said that he was from Osage, Iowa, in Austin temporarily.

W. V. Hanscom was in Austin in the middle and later nineties, and entered into partnership with Dr. William Coburn of that city in 1898. In the official directory of 1883-1890 of Minnesota, there were listed as of Minneapolis: W. H. Hanscom, University of Minnesota 1889, certificate No. 69-B (R) July 6, 1889; and W. C. Hanscome, Rush Medical College 1884, state certificate 925 (R) May 15, 1884. These names are given here because of the possibility that one of these physicians may have been in Austin in the nineties.

Milan J. Hart (1862-1931), one of Mower County's best loved and most able physicians, practiced in Le Roy from 1895 to 1921.

Born on a farm in Dover Township, Olmsted County, Minnesota, on May 9, 1862, Milan J. Hart was one of the five children of John G. Hart and Phoebe March Hart, early settlers in Olmsted County who had come from Ashtabula, Ohio. Mr. Hart died in 1876, four of the children left home early, and Milan was left with his mother (died 1895), to whom all her life he was a kind, devoted son, to work the farm alone.

He obtained his preliminary education under difficulties; his professional training necessarily was delayed. Inspired by Dr. Augustus W. Stinchfield, then of Eyota, the boy early resolved to be a physician. He had an aptitude, even as a small boy, for attendance on the sick, a capacity which Dr. Stinchfield noted when he was called to see a close friend of the Hart family and found the lad helping the patient. He said then, "Milan, you ought to be a doctor." Years later when the young Dr. Hart was thinking about a specialty, Dr. Stinchfield said, "Take care of the mother and the child and you will be a success," and in the course of a diversified practice Dr. Hart did make obstetrics a specialty.

As soon as he could arrange his affairs, Milan Hart entered the medical school of the University of Minnesota, earned his way through, and was graduated in 1895. Soon afterward he bought the practice of Dr. H. L. Knight, who was leaving Le Roy temporarily, and began his life as a physician. In 1897, his close friend and university classmate, Dr. Melvin C. Millet, became his partner and remained with him two years before joining the Mayo group in Rochester.

On September 15, 1898, Milan J. Hart was married to Mabelle Avery, a school teacher, daughter of Mr. and Mrs. John Avery, of Le Roy. Mr. Avery, a merchant,

and his wife had come to Le Roy in 1869 from Kendalville, Indiana.

In his years in Le Roy, Dr. Hart carried a heavy general practice in village and countryside. With the coming of World War I, many physicians went into the service so that here, as elsewhere, few were left in the locality, and when the region was swept by a severe epidemic of influenza, Dr. Hart and Dr. Aaron E. Henslin, who also had settled in Le Roy in 1895, shared the work. They were not in partnership, but were friends, and both were dedicated physicians. On one day, Dr. Hart would go west, seeing the patients of both, while Dr. Henslin would go east, taking care of all. Another day, one would cover the territory to the north, the other, the communities to the south.

Dr. Hart was faithful to both civic and professional obligations. He was a member of the school board and its president for several years. At one time, he was president of the local telephone company, and vice-president of the First State Bank of Le Roy. He was a member of the Southern Minnesota Medical Association, its vice-president in 1901; the Mower County Medical Society, one of its early presidents; and of the state and the national medical associations. Perhaps he rendered no greater service than as president of the county board of health for many years.

Because of his own early struggle, Dr. Hart felt sympathetic interest in young people, especially those who had difficulties to overcome, and he quietly encouraged and helped them. Long afterward, it was learned that he had special pleasure in giving financial help to medical students who had need of it, as he had needed such help in his university days. To their credit, most of them paid him back.

After twenty-five years in Le Roy, Dr. and Mrs. Hart in 1921 removed permanently to California, first to Redlands for a year, then to Pasadena, where Dr. Hart was in practice with Dr. George E. Campbell, formerly of Wykoff, Fillmore County, Minnesota. In 1923, they returned to Redlands and there Dr. Hart practiced for the ensuing six years. Because of progressive ill health, he retired from practice in 1930. He died in Redlands on March 24, 1931, from high blood pressure and the resultant cardiac strain.

Some ten years after Dr. Hart's death, Mrs. Hart, visiting in Rochester, Minnesota, reminisced delightfully of early humorous incidents in their domestic and social life and, particularly, of some of the doctor's experiences in his first years of practice: his finding himself, while trying to answer an emergency call in a blizzard, driving over fences drifted post high with snow; his amputation of a man's leg mangled in an accident with farm machinery, the operation being performed in the kitchen of the farm home with an ordinary kitchen butcher knife, sharpened and sterilized, because his emergency kit was not at hand; and of one of his more disagreeable experiences in attempting to enforce quarantine in scarlet fever. On that occasion an indignant and uncooperative householder reported him to the State Board of Health. Dr. H. M. Bracken, then chairman of the board, replied, "If I ever found Dr. Hart remiss in his duty, I would remove him, but I never have."

Christian A. Hegge (1866-1936), who for thirty-seven years (1893-1930) was a respected citizen and a skilled physician and surgeon of Austin, Mower County, held the esteem and affection of the community.

Born on the Hegge farm, Biri, Norway, on April 23, 1866, he was the son of Mr. and Mrs. Andreas Hegge. After attending grade school and high school, he enrolled at one of Norway's best agricultural colleges from which he was graduated with the degree of bachelor of agriculture. For a year after graduation he was manager of a large farm. In that period, Dr. O. H. Hegge has said, young people in Norway had what was called "America fever," and immigration to the United States was common. Christian A. Hegge decided to try his luck in the new world, and in 1887 he arrived at Whitehall, Wisconsin, where during his first summer in America he worked for a distant relative, Mr. Ekern, a well-to-do mill owner.

In the autumn of 1887, Christian A. Hegge went to Minneapolis and registered at Augsburg College, of which Professor Georg Sverdrop, a graduate of the University of Oslo, was president. After a year at the college he went out into the Norse settlements of Minnesota selling religious books, mostly Bibles, to earn money to continue his education. In September, 1889, on the advice of Professor Breda, head of the Scandinavian Department of the University of Minnesota, and himself a graduate of the University of Oslo, Christian A. Hegge and his brother, Olav H.

Hegge, who had arrived in Minneapolis from Norway the previous day, enrolled at the University.

After two years at the University of Minnesota, C. A. Hegge and O. H. Hegge registered in the medical department of the University of Illinois, from which they were graduated with honor on April 12, 1893. In that period internship was not required, and there were few graduates who wanted to spend the necessary time and money for the purpose. The Doctors Hegge were two who recognized the importance of the additional training. Dr. C. A. Hegge served his internship, one of the first to be granted by the institution, at the Minneapolis City Hospital, and joined Dr. O. H. Hegge in practice in Austin, Mower County, in December, 1893. Dr. O. H. Hegge, on December 12, 1893, first had visited Austin, and with Dr. C. A. Hegge had made arrangements for beginning the practice of medicine there.

At that time, Austin was a county seat of 3,000 inhabitants. There were few facilities, no telephone, no paving, no electric lights, no automobiles. The country roads were dusty, muddy or snow covered according to weather and season, and over them, in those horse-and-buggy days, Dr. C. A. Hegge and Dr. O. H. Hegge soon were covering four counties in Minnesota and three counties in Iowa. They worked hard, almost day and night, and often under great difficulties. For a time in 1894 they maintained an office in Blooming Prairie, Steele County, as well as in Austin. For a considerable period, their best known fellow physicians in Austin were W. H. McKenna, A. W. Allen, C. H. Johnson, Alexander MacDonald and F. E. Daigneau. The Doctors Hegge kept abreast of medical advance by activity in medical associations, and by study and observations at hospitals and clinics both in the United States and in Europe, particularly in Germany, the Scandinavian countries, and England.

Dr. C. A. Hegge served often as a county physician and as city physician. He and his brother were the first to recognize the need for a local hospital, and Dr. C. A. Hegge gave his energies to aiding Dr. O. H. Hegge in the organization of St. Olaf Hospital, Austin, which was opened in 1896, and was a member of the first staff of the hospital. Dr. C. A. Hegge early became a member of the Southern Minnesota Medical Association, was a founder and the first secretary of the Mower County Medical Society, and a member of the Minnesota State Medical Association. He was a supporting member of St. Olaf Lutheran Church, and was active in fraternal organizations, among them the Masonic Lodge, the Knights of Pythias, and the Knights of the Maccabees. Politically he was a Democrat.

The partnership between Dr. C. A. Hegge and Dr. O. H. Hegge continued for thirty-seven years. In 1929, when Dr. Rolv S. Hegge, son of Dr. O. H. Hegge, joined the firm, in their "Hospital Clinic," Dr. C. A. Hegge, who for some time had wanted to revive his study of agriculture and horticulture, removed to his ranch in the Magic Valley of Texas, in Cameron County, near La Feria. There he raised oranges and grapefruit with enjoyment and success. He never again practiced medicine.

Christian A. Hegge was married on May 14, 1895, to Isabel Dalager, a school teacher of Minneapolis. Two daughters, Nina and Agnes, were born to the marriage. In Texas Dr. and Mrs. Hegge made their home at La Feria. Dr. Hegge died in Texas in 1936 from coronary thrombosis, at the age of seventy, survived by his wife and his daughters. When Mrs. Hegge died a few years ago, she was buried beside her husband in La Feria. In 1957 the elder daughter, Nina Hegge Vignes, still lived on the Hegge ranch.

Olav H. Hegge (1872-—) in 1960 is in his sixty-eighth year of continuous practice as physician and surgeon in Austin, Mower County.

Born in Biri Parish, Norway, on March 20, 1872, a half brother of Christian A. Hegge (*q.v.*), O. H. Hegge received his earlier education at a private school, at high school, and at Aars and Voss College, Oslo. In 1889 he came to the United States to join C. A. Hegge, who had been in Minneapolis since 1887. On his second day in Minneapolis, O. H. Hegge, with his brother, enrolled at the University of Minnesota. Better prepared academically than most students, he was prepared to write and speak English, German, and all the Scandinavian languages, and had some knowledge of French.

Together with his brother, as he has said, he "headed for the study of medicine," and in the autumn of 1892 both O. H. Hegge and C. A. Hegge entered the medical department of the University of Illinois, from which they were graduated with

honor on April 12, 1893. Dr. O. H. Hegge at that time had spent four years in continuous study in this country and he was anxious to return to Minnesota to practice medicine because a great many of his native countrymen by then had settled in this state. He served his internship at Bethesda Hospital, in St. Paul, and on December 12, 1893, began the practice of medicine in Austin, in partnership with Dr. C. A. Hegge.

Those were still pioneer days, in the difficulties of medical practice, lack of facilities and conveniences and in the hazards of travel at all hours and in all seasons over unimproved roads. The lives of Dr. O. H. Hegge and his brother were a saga of unremitting hard work and devotion to their profession. Dr. O. H. Hegge, again in common with Dr. C. A. Hegge, was a constant student of medicine, in the medical literature, in medical societies, and in attendance at clinics in this country and in England, Germany and the Scandinavian countries.

One of the chief services Dr. O. H. Hegge rendered his city and community was the founding and initial financing of St. Olaf Hospital, opened in Austin in 1896. In the establishment of the hospital, of which he was the first surgeon, he gives much credit to Dr. C. A. Hegge and other physicians of Austin and to the congregations of St. Olaf Lutheran Church and other Lutheran churches of the vicinity.

Dr. O. H. Hegge was the chief organizer of the present Mower County Medical Society, which now has functioned successfully for more than five decades. He long has been an active member of the Minnesota State Medical Association and the American Medical Association. In 1944 he was honored as a member of the Fifty Year Club of the state medical association, at a meeting in Rochester. In 1947 he was a guest of honor, with Dr. A. E. Henslin, Le Roy, and Dr. G. J. Schottler, Dexter, at a dinner given in Austin by the Mower County Medical Society in recognition of the more than fifty years of service in his county, of each of the honored guests.

In past years, Dr. Hegge was city physician and county physician. He has been local surgeon to the Milwaukee, St. Paul and Pacific Railway Company for forty-five years. During World War I, from the first day to the last, he was Chairman of Medical Advisory Board No. 20. In private practice he long has been president of the Hospital Clinic. He is a co-founder and a director of the Austin State Bank, and is president and a director of the Austin Savings and Loan Association, with more than sixty years of service in the institution. Dr. Hegge is a supporting member of St. Olaf Lutheran Church. When Austin was struck by a disastrous tornado some years ago, in which the church building was destroyed, Dr. Hegge was appointed chairman of both the finance and the building committees, which built and fully financed the new edifice, the largest Protestant church in the city. He is a Republican, and the member of civic and fraternal organizations, among them the Kiwanis Club and the Masonic Lodge. He finds recreation in travel, reading, and fishing.

Olav H. Hegge was married on April 20, 1898, to Stella L. Johnson, a fine and competent woman, a daughter of Mr. and Mrs. Seymour Johnson, early settlers in Austin. Three children were born to Dr. and Mrs. Hegge: Rolv S. Hegge, who died in 1955; Milda L. (Mrs. L. H. Williams), who died in 1936; and Valfrid M. (Mrs. Theodore Heimark). Mrs. Hegge died fifteen years ago. In 1957 there were eight grandchildren, four boys and four girls, all well educated and well established in life.

Dr. Hegge has said that he planned his life span as follows: First, thirty years for education; second, thirty years for very hard professional work; third, thirty years for moderate work, the evening of life, provided that he should live to become ninety years old. He thought, "We should try to lenthen the productive period of our lives and always remember that 'good nature is good business.' " His life-long motto has been, "Expect the best, prepare for the worst, take what comes."

A brief note is given here about the late Dr. Rolv S. Hegge (1902-1955) who, although not in the group with which this history primarily is concerned (physicians who entered practice prior to 1900), played an important part in the practice of medicine and surgery in Austin in association with his father and his uncle.

Rolv S. Hegge was born in Austin, Minnesota, on July 2, 1902, the son of Dr. O. H. Hegge and Stella L. Hegge. He was graduated from the Austin High School, St. Olaf College, in Northfield, Minnesota, and, in 1928, from the University of Minnesota with the degree of doctor of medicine. He served his internship at St.

Mary's Hospital, Duluth, and in 1929 began the active practice of medicine with his father and his uncle in Austin, as a member of the Hospital Clinic. In 1950 Dr. R. S. Hegge was taken ill with multiple sclerosis, a disease of unknown causation which affects relatively young persons. This disease afflicts more than 250,000 persons in the United States; and at present, satisfactory treatment is not available. Dr. R. S. Hegge served successfully in the Hospital Clinic for twenty-one years from April, 1929, into 1950. By the latter year he was handicapped so severely that he had to resign. Dr. Hegge was a high-ranking Mason, a Knight Templar, and a member of the Presbyterian Church.

Rolv S. Hegge was married on April 7, 1930, to Dorothy J. Botz. To this marriage three daughters were born. When Dr. Hegge died, December 4, 1955, his wife and the children survived him. Dr. Hegge was a kind husband and father, a devoted son. He was respected and esteemed in his community. He treated all alike, rich and poor, and never shirked his duty. His guiding prayer was:

> Lord grant that mine ears be swift to hear
> The cry of those in pain.
> Give to my tongue the words that bring
> Comfort and strength again.

Aaron E. Henslin (1865-1950), of Le Roy, was a valued and progressive physician and citizen of Mower County for nearly sixty years.

Born on June 20, 1865, on a farm near Racine, Mower County, Aaron E. Henslin was the son of Frederick Henslin and Ernestine Weckworth Henslin. Mr. and Mrs. Frederick Henslin were natives of Germany who came to America as children with their respective parents. Both families first settled at German (New Baden), Wisconsin. The Henslin family moved to Brownsdale, Mower County, Minnesota, in 1859, and to Racine in 1864. Mrs. Henslin died in 1891; Mr. Henslin moved to Sargent, Mower County, in 1901; his death occurred there in 1903. There were nine children, of whom seven were living in 1924.

Aaron E. Henslin, the second eldest child, received his early education in the schools of Racine, and at the high school of Spring Valley, Fillmore County. In 1891, he received the degree of doctor of medicine from the College of Physicians and Surgeons of Keokuk, Iowa, and began the practice of medicine at Adams, Mower County. In the next four years, he continued his medical education: at Rush Medical College, at the Chicago Polyclinic, and at the Milwaukee Medical College, from which he was graduated in 1895. At the last-named school he was an instructor in anatomy. Thus, well prepared for continuation of practice, he settled permanently in Le Roy in 1895.

Those were still years of pioneering, and Dr. Henslin, with his fellow physicians, experienced all the hazards and difficulties of the time: limited facilities, no local hospitals, bad roads, torrential rains, severe winter weather. An instance of extreme test of endurance was the severe epidemic of influenza in 1918 when Dr. Henslin and his close friend, Dr. Milan J. Hart, who also had settled in Le Roy in 1895, gave valiant service, well remembered in the community. They shared the burden, each covering a large territory: on one day one would cover the territory to the north, the other, the region to the south; and on the following day one would go east, the other, west, each seeing the patients of both.

Dr. Henslin served in various civic capacities, notably as president of the village council, president of the school board, and member of the library board. Before 1900 he started operation of the telephone system which later became the Le Roy Telephone Company, with numerous exchanges in near-by towns. He was a member of fraternal organizations, among them the Benevolent and Protective Order of Elks, of Austin, the Modern Woodmen of America, and the Independent Order of Odd Fellows, and was medical examiner for other groups. In politics he was an Independent Republican. When time permited, he found recreation in chess, and in hunting and fishing.

His professional record is a distinguished one. In addition to a widespread general practice of medicine and surgery, he was at different times a county physician, health officer, and for twenty years county coroner. He was associated with St. Olaf Hospital, Austin. He was an organizer of the Mower County Medical Society, twice its president, and for thirty years continuously, its treasurer. In 1937 Dr. Henslin was honored at a social function given by the people of his town and community. When, on March 26, 1947, he was honored by the Mower County Medical Society,

with Dr. O. H. Hegge and Dr. G. J. Schottler, for his fifty-six years of service as physician and surgeon in Mower County, he received additional tribute for his service as treasurer. Dr. Henslin was an active member of the Southern Minnesota Medical Association, the Minnesota State Medical Association, and the American Medical Association.

Aaron E. Henslin was married on June 1, 1905, to Mary Louisa Pinckney, daughter of Mr. and Mrs. James Pinckney of Racine. Mr. and Mrs. Pinckney came to Racine from Syracuse, New York, in 1867. Mrs. Henslin took an able part in the social, church and civic life of Le Roy. At various times she was president of the local History Club, president of the Library Association, a member of the park board, and chairman of the local Ladies Republican Club.

Dr. and Mrs. Henslin were the parents of two sons: Robert Frederick, who died in youth, and Merrill Edgar. Mrs. Henslin died on November 10, 1940. When Dr. Henslin died March 25, 1950, at Cresco, Iowa, he was survived by his son, Dr. Merrill E. Henslin, then of Cresco, and by two sisters.

Dr. Merrill E. Henslin later returned to Le Roy to practice, and subsequently removed to Garden Grove, California, where, in 1956, he was a practicing surgeon.

William L. Hollister (1837-1921) was a prominent physician and citizen of Austin and Mower County for fifty-three years. Truly a pioneer, he experienced all the difficulties and hardships of medical practice in the decades before the turn of the century. "He served this community with a devotion which knew no reserve, and a kindness which never failed."

Born on January 9, 1837, in Sharon, Schoharie County, New York, William L. Hollister was one of the six children, four sons and two daughters, of Luther Hollister (1802-1888) and Jane Onderdonk Hollister (1811-1892). The Hollisters of this branch were descended from Lt. John Hollister, who came from England to Connecticut in 1642. Members of the family were prominent in Colonial affairs, and several served with the Colonies in the American Revolution. The first Hollister to settle in New York State in 1800 was the father of Luther Hollister.

Before William L. Hollister was two years old, the family moved to a farm in Montgomery County, New York. Here he grew up, worked on the farm in summer and attended district school in winter until he was eighteen. He then entered Fort Plain Seminary, taught district school for two years after graduation, and at the age of twenty-two began the study of medicine under Dr. A. H. Knapp, who later for many years was superintendent of the hospital for insane at Ossawattoma, Kansas. William Hollister next took a "full course of medical lectures" at the Albany Medical College, from which he was graduated in 1861. He first practiced medicine in Stuyvesant, New York, and later in Kingston, where for two years he was assistant surgeon in the office of the provost marshal.

On January 9, 1862, William L. Hollister was married in Coxsackie, New York, to Mary M. Beatty (1837-1929), daughter of Mr. and Mrs. William Beatty of that place. In 1868, Dr. and Mrs. Hollister came to the village of Lansing, Mower County, and in 1871 to Austin, to the residence on South Main Street that was their home for the remainder of their lives. They were the parents of three children: Clarence and Lansing O., who were born in New York, and John Francis, who was born in Lansing, Minnesota. Early in 1878, all three boys were stricken with diphtheria: Clarence, the eldest, then about twelve years of age, died on January 13, 1878. A few years later, on November 13, 1882, John Francis, the youngest, then twelve years old, died tragically from tetanus, the result of an accidental gunshot wound of the right hand and arm received while hunting.

In 1880, Dr. Hollister was admitted to the Minnesota State Medical Society, one of the earliest members in Mower County. After 1883 he practiced medicine under an exemption certificate. Early interested in medical organization, in February, 1880, he was one of the physicians of the county who were instrumental in organizing a medical society in which the physicians of Freeborn, Steele and Fillmore Counties were invited to join. The resulting organization, called "The Southern Minnesota Medical Society," perhaps was the forerunner of the Southern Minnesota Medical Association (founded in 1892) and possibly was the "old Mower County Medical Society" of which mention has been noted. Dr. Hollister was a founding member of the present Mower County Medical Society. About 1905 he retired from active medical practice.

An ardent Republican, for many years Dr. Hollister took an active part in political and civic affairs, and he retained his interest in them to the end of his life. In 1882 he was elected state senator from his district and in this capacity was influential in procuring the passage of the Medical Practice Act of 1883. He worked to perfect the laws concerning infectious diseases, and aided in the enactment of many other laws relating to public welfare. In 1883, he resigned his senatorship to accept appointment as a United States revenue inspector. A year and a half later he resumed medical practice in Austin and also his activity in civic life. During his years in Austin he served as a member of the city school board, for many years as a county commissioner, and as examiner on the local board of the United States Bureau of Pensions. At various times, he was coroner and a county physician. In 1907, he again was elected to the state legislature, as representative.

Among the fraternal organizations of which he was a member were the Masonic Lodge and the Austin Lodge of the Benevolent and Protective Order of Elks; of the latter he was a charter member and one of the first officers. The Hollister family attended the Congregational Church.

On February 25, 1921, Dr. William L. Hollister died at his home from acute pneumonia, after an illness of six hours. He was survived by Mrs. Hollister and a son, Lansing O. Hollister. Mary Beatty Hollister died December 28, 1929, from the infirmities of old age.

Lansing O. Hollister, the last member of the immediate family in this region, it is believed, died in Austin a few years ago. He was married on November 27, 1889, to Mattie E. Messersmith of Austin; at that time he was assistant cashier in a bank in Morris, Minnesota. A later marriage, about 1912 (?), was to Mrs. J. M. Thomas, of Austin. He then was employed as bookkeeper at the Hormel Packing Plant; he and his wife made their home with Dr. and Mrs. Hollister. An old scrapbook of the Hollister family contains many interesting newspaper clippings concerning various members of the Hollister and the Beatty families, some of whom had visited, or had lived for a time, in Austin.

E. P. Hudson "came to Austin about 1891."

— **Huffman**, an eye and ear specialist from St. Louis, practiced in Austin for a few months in 1863. It seems almost proved that this man was the Dr. Huffman, apparently an itinerant practitioner, who was in Preston, Fillmore County, early in 1863, there exhibiting, according to the *Preston Republican,* "much skill in the way of restoring loss of sight and hearing. Those afflicted with diseases of the eye and ear would do well to call at the Minnesota House and consult him."

William R. Hunter (1813-1874), physician, surgeon, and dentist, spent about eighteen years in Minnesota during an interesting period in the history of the state. Born on October 14, 1813, at Strong, Franklin County, Maine, he was graduated from Bowdoin College, Brunswick, Maine, in 1844, and from Jefferson Medical College, Philadelphia, in 1848. Dr. Hunter came to St. Cloud, Stearns County, Minnesota, in 1856. His residence in the state was broken by his return to Maine, where he spent the winter of 1865. There is record that on his return to Minnesota he was on the medical staff of the Northern Pacific Railway, and that in 1871 he traveled the lines between St. Cloud and Brainerd, checking on the health of the railway employes. In 1872, it is said, he was physician for the Pembina branch of the railroad, and in that period he moved from Glyndon to headquarters at Red Lake Crossing.

Although local accounts agree as to season of Dr. Hunter's arrival in Brownsdale, Mower County, and length of residence, they differ as to year. The verified date of his death, April 24, 1874, however, establishes the time of arrival as the autumn of 1873: "his death occurred there the following year, after an illness of a few days from inflammation of the lungs."

(To be Continued)

President's Letter

OPPORTUNITY FOR ACTION

We are now in the early aftermath following a momentous election. A period when the winners will re-assemble their forces to attempt the implementation of their promises to the people. Congress, when convened, will surely reconsider many measures relating to the health care of our people.

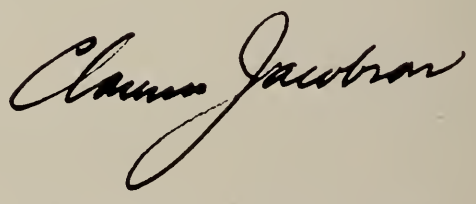
The voluntary approach to meet the health needs of our nation has gone forward with surprising rapidity. Competition has stimulated Blue Shield and Blue Cross plans to improve their contracts. Uniform programs by Blue Shield, adequate to meet the demands of the National market in negotiating contracts with government employees, union labor, and employer groups, were strongly advocated by Blue Shield leaders at the annual Program Conference in Chicago in October.

Medicine scored a respite in the passage of H.R. 12580 for the health care of the aged. This measure permits temporary increases in federal grants to help with the 2,400,000 persons on old age assistance and with matching funds to the states for financing the health care for an estimated 10,000,000 aged who are not on relief but who do not have sufficient income to meet the cost of illness. It is already evident that the opportunists, and some well meaning people, will endeavor to prevent the implementation of H.R. 12580 in many states.

Cabinet member, Arthur S. Flemming, Secretary of Health, Education and Welfare, in a strong address, said past experience in the Department of Welfare indicates that states will be quick to act. This was proven twenty-five years ago when forty-one states responded to O.A.A. legislation within one year.

Our duty is clear. We must appeal to our state legislators, urging them to activate the new program. Minnesota offers a better than average opportunity for its usefulness and success.

Our attention was also called to unfinished business. Many aged desire to *prepare* for a crisis. This laudable desire, a fundamental ingredient in our American way of life, cannot be ignored. We are indeed at the crossroads in this controversy in caring for the aged. "A voluntary plan helping those who wish to *prepare* for a crisis is the key." It is significant that the citizens of our country wish to give the aged the opportunity to help care for themselves. The Ways and Means Committee, the Finance Committee and finally the Congress, our duly elected body, have so indicated. America can and has progressed on this voluntary plan, "the freedom plan." Compulsion leads to confiscation which ultimately leads to complete containment, slavery.



President, Minnesota State Medical Association

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.

THE ART OF MEDICINE

The art of medicine is in need of scientific study. This was the theme of Dr. George Engel, Professor of Psychiatry from the University of Rochester, when he spoke at a University of Minnesota Medical School convocation, July 20, 1960.

Doctor Engel said that the true clinician has something in his bedside manner, in his concern for, his friendship toward, his counseling and comforting of his sick patient that influences the course, severity, duration of, and even recovery from the disease; that the diagnostic and therapeutic factors inherent in the doctor-patient relationship can and ought to be the subject of scientific inquiry.

However, in order to begin a scientific investigation, disease must be redefined in a broader sense. In this broad sense, the diseased state is a condition of life defined by disturbed adjustment and altered structure and function in relation to the state of health. The stresses that affect the state of health and cause disease can be produced by diverse and multiple agents. Significant stresses can be positive, something happening to the person, or negative, something *not* happening to the person.

Doctor Engel discussed grief as a disease to show how the inter-personal relationships affect both health and disease. For health each individual requires human contacts, the number and variety required varying from person to person and according to his specific ability to react to these human contacts. Grief as a disease is most commonly caused by the loss of a personal human contact, although at times loss of a job, failure to achieve a goal, loss of money, may also be pathogenic.

Like any other disease, grief has a predictable natural history. There is first a state of shock in which the person is unable to respond to, even to accept the loss of the loved one. He may not respond normally to familiar situations. The shock is followed by a variable period of emotional release, sometimes controlled, sometimes not. At times, the person reciprocates between shock and emotional release. These give way to a continual preoccupation with the dead, where the suffering one feels that he must remember the lost because no one else will, because the others have forgotten already. Actual physical symptoms develop. A predisposition to organic disease is formed. Organic diseases such as coronary thrombosis, stroke, ulcer, cancer, diabetes, arthritis, cholecycitis, are initiated when other causes have created a predisposition. The physical symptoms of the induced diseases may confuse the real cause of the illness.

Psychologic reactions follow: Depression, guilt feelings, hostility, and refusal to enter normal activity. They may occur sequentially or simultaneously and may be of long or short duration.

When feelings of helplessness and hopelessness develop, the organic and psychologic manifestations of grief become extreme, debilitating and even fatal. On the other hand, when feelings of helplessness and hopelessness are not present, these grief manifestations may be short and mild or even absent from the course of the disease.

Recovery begins with a gradual realization of the unreality of the grief behavior and is complete when readjustment is made to the remaining human contacts.

Treatment is based upon a therapeutic replacement, by the physician (or clergyman) or by something he does or says within the doctor-patient relationship, substituting in part for the lost loved object.

Grief cannot be prevented—death is the price we pay for life—but the physician can often prevent the pathologic consequences of grief by psychological preparation for this loss of a loved one and by early recognition and treatment of grief.

This analysis of grief as a disease clearly identifies three views of medicine that are becoming increasingly important today:

1. The mantle of the physician includes more than the laboratory and the pharmacy, it includes the art of medicine, the psychosomatic approach and the bedside manner.

2. Any training of physicians to interpret disease solely through the eyes of the laboratory and to treat disease solely through the hands of the pharmacy is scientifically wrong and dehumanizing to both physician and patient.

3. Scientific investigation of the relationship between physician and patient, the forces bringing them together, and the means by which the physician's attitudes and actions affect the patient are necessary.

Warren J. Warwick, M.D.

DELINQUENCY PRONE PERSONALITIES

II. The Sociopathic Personality: Diagnosis

The first article in this series stressed the need to think of delinquency as a symptom occurring in a number of syndromes. The diagnostic groups contributing the largest number of cases displaying antisocial reactions include those where the primary pathology is within the delinquent youngster's personality. These may be sociopathic, schizophrenic, neurologic, low intellect, or severe neurotic syndromes. The most common is the sociopathic personality.

According to Preu[5] priority for describing the syndrome we now call sociopathic goes to Prichard, an English psychiatrist. In 1835, Prichard[6] wrote about a form of behavior characterized by complete inability to make use of education in learning to conform to the social order. These individuals could not profit from experience, no matter how often punished. Though of good intelligence, he called them moral imbeciles, thus emphasizing the deficit of moral capacity. Just as the mentally defective imbecile learns but little in the intellectual areas, these persons could learn but little in the area of impulse control. They were completely selfish, without regard for others, and, indeed, despite their self-centeredness were as well without regard for the consequences to themselves for their acts.

Because of the thinking of the times in the last century and that of later years, the moral imbecile came to be called the constitutional psychopathic inferior, a term introduced by Koch in 1891.[4] That the disorder may be a form of insanity and that it may be constitutional as well, continue to have considerable acceptance, as seen for example in the compelling writings of Harvey Cleckley.[2]

Since 1952, with the revision of the American Psychiatric Association's diagnostic nomenclature, the term used for these persons has been sociopathic personalities. The term sociopathic is descriptive of the focal problem these individuals present: their disturbed social adjustment. It is in relation to other people and particularly with the rules of society that the sociopath has trouble.

Much of the differential diagnosis of sociopathy versus other syndromes is made on the basis of the individual's history. The personality development of the sociopath is almost always marked by frequent bouts with authority. These individuals are mostly boys who, as children, are difficult for their parents to manage. They demand immediate gratification and are sometimes recognized by others as "spoiled." They learn to manipulate their parents, to avoid punishment by deceit and by promises to improve. They are often lavishly rewarded for their ability to avoid responsibility. In school, they underachieve even when of high intellect. They are rebellious and difficult discipline problems. They blame their poor grades on poor teachers, and disciplinary problems are said to be the fault of bullies and/or unfair treatment by the principal. And so it goes on through school into adolescence, where this kind of person begins to show signs of real delinquency. These days that often involves illegal use of automobiles, driving without owner's permission, staying over curfew, stealing ornaments and gadgets, speeding, reckless driving, and even stealing cars. Sometimes this appears not to be more than an exaggerated state of normal adolescent rebellion and striving for independence. Such boys may grow up to be happy, fairly well adjusted, and extroverted adults. Even as adults, however, though they may avoid legal trouble, they usually underachieve their potential, as recent work by Briggs and Wirt[1] has shown. Others, and this *is* a minority, do not make good adjustment as adults and continue in their psychopathic ways until finally they commit felonies which result in long prison terms.

Most of these children are from poor homes deprived both economically and psychologically. The majority have backgrounds of severe neglect, poverty, disease, and dissocial example on the part of parents and siblings. In interview, these youngsters are found to be suspicious of adults, to be bitter about their circumstances, but to be without apparent ability to make sensible plans, to use good judgment or even to use common sense. They

demand a great deal from others but they are unable to share either material things or human emotions. The only emotion they express with conviction is anger. When one hears about the background of such a youngster, one does not wonder at the result. Their histories are filled with rejection, beatings, drunken and promiscuous parents, and direct teaching of criminal attitudes. On the other hand, some come from apparently fine homes, where well-meaning parents of high ethical standards are left frustrated and heartbroken at the failures they have produced.

Psychological tests are widely used in identifying such youngsters. Locally, the most notable of these efforts are in the studies of Hathaway and Monachesi[3] and of Wirt and Briggs.[7] They find that about one-third of all youths adjudicated delinquent are of the personality disposition described. The psychological test used has been the Minnesota Multiphasic Personality Inventory (MMPI). The scales of this test which are elevated in the delinquency prone youngsters are Psychopathic-deviate (Pd), Schizophrenia (Sc), and Hypomania (Ma). Moderate elevations on these scales characterize many adolescents, in fact they are the modal personality pictures seen in youths. In the case of adult offenders, recent research at the Minnesota State Prison by Wirt and Jacobson[8] shows that the majority of the inmates have MMPI profiles and personalities of the sorts just described. In the Wirt and Briggs[7] study, it was found that nearly half of the boys with such a personality configuration who came from deprived home conditions later became delinquent. We are now attempting to devise means for intercepting such boys before the delinquency occurs with the hope that suitable programs of prevention may be devised. The sociopath, whether or not it is possible to effect change in his basic personality structure, may be helped to avoid a criminal career.

There are large numbers of potentially delinquent young people, amounting to about 20 per cent of the total adolescent age group. The research data suggest that, given a weak family and neighborhood environment for a young person with poor frustration tolerance, the probability of his having trouble with the law is substantial. It is imperative, therefore, that prophylactic and remedial procedures be begun as early as possible and that they be aimed at the group most likely to need such treatment programs. At best, treatment for them is a difficult enterprise.

References

1. Briggs, P. F. and Wirt, R. D.: Achievement among delinquency prone adolescents. Paper read at the 1960 American Psychological Association meeting.
2. Cleckley, H.: The Mask of Sanity. St. Louis: C. V. Mosby & Company, 1955.
3. Hathaway, S. R., and Monachesi, E. D.: Analyzing and Predicting Juvenile Delinquency with the MMPI. Minneapolis: University of Minnesota Press, 1953.
4. Koch, J. L. A.: Die Psychopathischem Minderwertigkeiten. Ravensburg: Maier, 1891.
5. Preu, P. W.: The concept of psychopathic personality. *In* J. McV. Hunt (Ed.): Personality and the Behavior Disorders. Pp. 922-937. New York: Ronald, 1944.
6. Prichard, J. C.: Treatise on Insanity. London: Gilbert & Piper, 1835.
7. Wirt, R. D., and Briggs, P. F.: Personality and environmental factors in the development of delinquency. Psychological Monographs, 73, Whole No. 485, 1959.
8. Wirt, R. D., and Jacobson, J. A.: Experimental Studies in Group Psychotherapy with Prisoners. St. Paul: Authors, 1958.

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CAN THERE BE SOLO PRACTICE TODAY?

An excellent recent article by Florence R. MacNeill† indicates the current situation in medical care very well—solo practice is no longer "solo." Much as he would like to work alone, the practitioner must work with others in the care of the patient. The quality of care he gives the patient is proportional to the degree to which he can communicate with others.

Unfortunately, independence, which is said to be a prime characteristic of physicians, makes it difficult to get across to some of them the great need for communication and leadership.

Miss MacNeill has used the following quotation from a report of the Massachusetts Medical Society's subcommittee of the National Commission on the Care of the Patient:

"The physician, apparently, has failed more than any other of the human elements involved, to join the patient care lineup as a co-operating factor. Best fitted to lead the team he neither leads nor participates in its joint effort, performing too independently his own functions in regard to patient care. . . . The Committee has astutely put its collective finger on man's greatest failing in the matter of mutual enterprise and human relations—namely, lack of communication."

†*Hennepin County Medical Society Bulletin,* 31:139 (Apr.) 1960.

My field is the area of hospital care, as it is affected by the lack of leadership and communication mentioned above and in Miss MacNeill's article. Before discussing the physician-hospital relationship, however, I should like to point out that the general practitioner in the rural area needs to realize that each of his patients has access to medical information via press, radio, TV, and magazines and therefore is less likely to be satisfied with a few words of explanation than were his parents. The availability of newer drugs makes necessary an explanation of their probable costs, their possible reactions, and the need for *not* keeping any which may not be used, in the expectation of using them for someone else in the family. This latter practice is an old habit but is much more hazardous than it was in former years, when drugs were less potent. The greater selective action also explains why more laboratory and x-ray examinations precede prescription these days.

The patient-physician-hospital relationship should be well launched by the natural leader, the physician. He should know both the patient and the hospital and should be able to explain to the former the whys and wherefores of the latter. He should indicate his part in ordering medications, tests, diets, and so on. It is surprising how many patients do not connect the physician with the fact that breakfast has been "forgotten," yet a word or two from the doctor would save the nurses and the dietary department from blame. Such an incident is always more difficult to erase from memory than it is to prevent from occurring.

A few words to the patient would explain the personnel necessary to help the doctor care for the patient in the hospital and, therefore, the cost of such care. A few more words can outline the benefits purchased by such care, many of which were not available a few years ago.

The doctor knows whether the patient is introspective and sympathetic, or otherwise—a word or two about this to the admitting office may avoid several room transfers, irritated patients, and unhappy personnel. A word of caution about needed isolation and the cost would ease the situation for both patient and cashier.

In summary, the physician should communicate his needs, and those of his patients, to the administrator of the hospital he is using. He should also explain to the patient the part the hospital plays in the patient's care. Only then will a truly satisfactory relationship between patient, physician, and hospital exist.

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CLINICAL USE OF GLUCAGON

Glucagon, or the hyperglycemic-glycogenolytic factor (HGF), was first described in 1924. An ephemeral hyperglycemia prior to the expected hypoglycemia was found in the early preparations of insulin. Crystallization of insulin by the method of Abel destroyed this hyperglycemic property, and for several years the initial hyperglycemia was attributed to contaminating substances. When insulin was crystallized by the method of Scott, the initial hyperglycemia was again demonstrated. This stimulated intense study which culminated in the crystallization of the hyperglycemic principle by Staub in 1953. The name glucagon or glucose-producing given to this substance by Murlin in 1924, has been adopted through general use.

According to the best present evidence, the alpha cells of the islets of Langerhans are the major (and possibly only) source of glucagon. Glucagon causes an elevation of the blood sugar through activation of the hepatic enzyme, phosphorylase, which catalyzes the breakdown of glycogen to glucose-1-phosphate. Free glucose is then formed through the action of phosphoglucomutase and glucose-6-phosphatase. A prompt elevation of hepatic vein and peripheral blood sugar results. Glucagon does not stimulate the degradation of muscle glycogen nor does it increase peripheral utilization of glucose.

Clinical studies have shown reliable hyperglycemia following the parenteral injection of glucagon. The intensity and rapidity of the hyperglycemic response is related to the route of parenteral administration. A maximal dose of glucagon has been noted in the normoglycemic individual, beyond which more glucagon fails to elicit further hyperglycemia. In the hypoglycemic individual this may not be true. There is evidence to suggest that the magnitude of rise in blood sugar is closely related to the amount of glucagon that is given. The maximal rise in blood sugar occurs from twenty to forty minutes after injection, again depending upon the route of administration. The duration of hyperglycemia varies from sixty to ninety minutes. Both degree of hyperglycemic response and duration of effect are determined by

TABLE I. BLOOD SUGAR ELEVATION FOLLOWING GLUCAGON
(1 mg. subcutaneously)

Patient	*Initial*	*Blood sugar (mg./100 ml.) 20 min. later*
S.D. #588464	50	97
M.R. #034919	57	127
	285	380
H.H. #504670	35	105
	under 20	65
Y.M. #911188	45	95
H.M. #325295	32	82
J.H. #064409	61	118
	89	103
I.H. #911962	30	70

four factors: (1) the size of the dose of glucagon; (2) the route of administration (i.e., intravenously, intramuscularly, subcutaneously); (3) the intensity of endogenous hypoglycemic activity, and (4) the availability of glycogen in the liver.

The use of glucagon clinically is helpful when acute hypoglycemia is present and the individual cannot take glucose by mouth because of cerebral disorganization or coma. The ease of administration of glucagon surpasses concentrated glucose solutions. One is obliged to give the latter intravenously; glucagon is quite effective when given intramuscularly or subcutaneously. Glucagon is also useful in the patient with chronic severe hyperinsulinism. Its use plus the use of supplementary glucocorticoid and glucose therapy will generally protect the patient from severe hypoglycemia. This latter clinical situation is very rare, while acute hypoglycemia in the diabetic patient under insulin therapy or in the psychiatric patient undergoing insulin shock therapy is relatively common. Glucagon is ineffective when hypoglycemia is due to glycogen storage disease. We have successfully terminated an episode of hypoglycemic coma due to chlorpropamide (Diabinese) with glucagon.

At the beginning of our investigations, we gave crystalline glucagon in doses of 1 milligram (10-20 mcg./kg.) to hospitalized diabetic patients with the signs and symptoms of hypoglycemia. A blood specimen for sugar was taken prior to the injection of glucagon and twenty minutes after glucagon. Table I records a sampling of the cases, showing the response of the blood sugar to glucagon. Because crystalline glucagon lacks indefinite stability, glucagon hydrochloride was developed. This preparation, indefinitely stable in the dry state, is put into solution when needed. Entirely comparable results have been obtained by us with glucagon hydrochloride using identical doses (10-20 mcg./kg.). We have used glucagon intramuscularly or subcutaneously. The intravenous route has been avoided because of its inconvenience. The intramuscular route is very satisfactory for routine hospital use; however, we were obliged to gain experience with the subcutaneous route in order to determine whether the use of glucagon in the home by non-medical people would be feasible. It is inadvisable to permit non-medical people to give injections by the intramuscular route. In general results using the subcutaneous route have been good. We have found clinical recovery to occur 5-15 minutes following an injection. The response is slower when glucagon is given subcutaneously as compared to the intramuscular route. Clinical recovery usually precedes the maximal rise in blood sugar. After clearing of the sensorium, we give the patient a measured amount of carbohydrate (10-20 grams) in order to maintain recovery and avoid a hypoglycemic relapse. The latter may occur with the waning of the effect of glucagon, if vigorous endogenous hypoglycemic activity persists.

Sometimes the desired effect fails to occur. This may mean no hypoglycemia existed. It is very important to obtain a blood specimen prior to therapy with glucagon. If the desired result following glucagon occurs, the specimen can always be discarded. If the desired result fails to occur, one has an initial blood sugar for reference. This procedure has resolved otherwise difficult clinical problems on several occasions. We have seen an occasional patient with proved hypoglycemia who failed to respond to 1 mg. (10-20 mcg./kg.) of glucagon. Recovery was effected with intravenous glucose. These patients have always been comatose. The unresponsiveness may be attributed to poor hepatic stores of glycogen, to sluggish absorption of glucagon, or to the administration of an insufficient amount of glucagon. Rarely irreversible hypoglycemic encephalopathy will be present. Glycogen depletion may occur in the patient with severe liver disease or in the patient with recurring acute hypoglycemia whose glycogen stores have not been replenished. We have been able to document this situation in only one patient. In order to assure an adequate dose of glucagon, we now give 2 mg. (20 to 40 mcg./kg.) to all patients comatose from hypoglycemia; 2 mg. of glucagon hydrochloride can be dissolved in 1 ml. of diluent. We have reserved the use of more than 2 mg. of glucagon at any one time to extraordinary situations. A dose of 2 mg. of glucagon has consistently roused the patient comatose with hypoglycemia.

Glucagon is of great practical value. In a hospital, it can be used by the floor staff much more easily than concentrated glucose solutions when treating the struggling, uncooperative patient, especially the child. The practicing physician will find the treatment of hypoglycemia in the office or home much easier with glucagon for similar reasons. In the home, a family member of the diabetic patient can inject 1 to 2 mg. of glucagon when severe hypoglycemia occurs, using the standard insulin syringe and needle. Many times, this obviates delay in onset of therapy and avoids a midnight ambulance ride to the hospital. The presence in the home of something (glucagon) useful when insulin coma occurs helps allay the anxiety of the patient and family regarding hypoglycemia. We do not advise glucagon for the average mild hypoglycemic episode, unless symptoms linger because of poor absorption of oral glucose due to pylorospasm.

Glucagon is very safe. We have recognized no toxic or allergic side reactions, either local or generalized. The main hazard of glucagon is the omission of close observation of the patient for the desired result. This observation period is mandatory. Glucagon is a valuable addition for the management of hypoglycemia in the hospital, in the physician's office, and in the home.

Fred W. Whitehouse, M.D.

WATER POLLUTION PROBLEMS

Water pollution is a major problem in the control of the sanitary environment and the well-being of mankind throughout the world. This is particularly true in Minnesota where water is so inextricably associated with the development and prosperity of the state. The lakes and rivers provided the first means of transportation and account for the early exploration of the area. They also provided sites for major cities, sources of convenient water supplies and means of transportation. They now must play a major role in meeting the explosive demands of present standards of living and statewide development of urban population, industry and recreation.

There are estimated to be over 5,000 lakes over 40 acres, 16,000 lakes over 10 acres and 24,000 miles of streams. These waters serve over one-third of the total population and more than one-half of the urban population with water for domestic purposes. There are more than 4,000 licensed resorts for people interested in recreation. Many of the major industries, especially those involving food processing, are located here because of the quality of water supplies. These plants frequently require more water with as high a quality as the nearby municipalities. The major portion of the water used by municipalities and industries is not consumed, but must be disposed of after use. The indiscriminate discharge of these waste waters into lakes and streams may be hazardous to public health, to domestic, commercial, industrial or recreational use or to livestock, wild animals, fish and other aquatic life. Its damage may be physical, bacteriological, biological, chemical or radiological. Controlling the discharge of these waste waters and providing treatment so they will not affect the beneficial use of streams is the pollution problem.

The responsibility for pollution rests with municipalities, industries and individuals concerned. State and Federal Control Agencies are partners with them in solving their particular problems.

Minnesota is in a unique position on the top of one of the continental watersheds. Except for one or two minor exceptions, the streams all rise in the state. Little can be done about increasing the rainfall and consequent overall flow of the streams; however, much can be accomplished in keeping the waters clean and of high quality.

Substantial progress is being made in construction of sewage and waste treatment works in the state and there is a growing awareness of the importance of water quality. No sewer systems have been constructed without treatment plants for many years. The cities are growing larger, however, and new industries are being developed and older industries are being expanded. Progress which is made is offset, in some places, by higher water consumption and greater discharge of wastes. The increased use of synthetic chemicals and petrochemicals and the accelerated development of local nuclear energy installations are examples of new sources of wastes which are being encountered today and what may be expected in the future. The success of the program requires the support and attention of everyone interested in conserving the quality and use of this most important resource—water.

Medical Economics

Edited by the
Committee on Medical Economics,
Minnesota State Medical Association
George Earl, M.D., Chairman

HEALTH AND MEDICINE BILLS HIGHLIGHT STATE LEGISLATION

Although 1960 was an "off year" for many of the state legislatures throughout the nation, a number of important laws pertaining to health and medicine were enacted by the twenty-two state legislatures that did meet.

Next year all but three legislatures will meet. It is expected that many of the key issues which faced state solons throughout the nation will also be considered by those who do meet next year, including Minnesota.

Members of the Minnesota State Medical Association are encouraged to acquaint themselves with these developments in order that they may be better prepared for what could also become key legislative issues in Minnesota in 1961:

Medical Practice Acts — The West Virginia State Medical Association was faced with a bill which would have made it mandatory for the Medical Licensing Board of West Virginia to issue special permits to graduates of foreign medical schools to practice medicine and surgery for five years, if the graduate had been accepted to practice in a hospital in West Virginia as a house physician under the supervision of the medical staff. The bill did not require that the hospital be accredited and did not define "hospital." The state association vigorously opposed the bill on the grounds that it would lower the standards of medical practice, that it would usurp the power of the Board to pass on the qualifications of those licensed to practice medicine, and that it discriminated against graduates of American schools. The bill was killed.

The Michigan State Medical Society supported a measure which removed a restriction that graduates of foreign medical schools must serve their internships in the state in order to be licensed. The bill became law.

Alaska enacted a medical practice act and also a basic science law.

A bill in Hawaii would have liberalized the licensing requirements for graduates of foreign medical schools. It passed the House but was not enacted.

In Massachusetts, a bill was enacted requiring graduates of foreign medical schools to take the examination of the National Board of Medical Examiners in order to obtain a license to practice medicine. This law was then amended by another measure exempting diplomates of specialty boards recognized by the AMA from the necessity for taking this examination.

Chiropractic—The chiropractors were active in attempting to obtain legal status in states where they are not recognized. A proposal in Louisiana to legalize the practice of chiropractic was defeated by a substantial majority in the state Senate, due to active opposition of the state society.

There was no action in Massachusetts on a bill to establish a licensing board for chiropractors. Similarly, the bills in New York proposing licensure received no action despite very active lobbying by the chiropractors in both houses. There was no chiropractic bill reported in Mississippi, the only other state which presently does not license them.

There were also attempts in New York by the chiropractors to limit the operation of x-ray machines to those holding certificates as x-ray operators, and to exempt chiropractors from jury duty. Both proposals were defeated.

In Alaska, a bill to set up a state board of chiropractic examiners for the purpose of licensing chiropractors received no action, although chiropractic is recognized in that state.

The Rhode Island Medical Society managed to have a bill vetoed by the Governor which would have allowed chiropractors to render "medical care" to public assistance recipients. (Note—an extensive and excellent study on chiropractic in California has just been published by the Stanford Research Institute of South Pasadena, California. The AMA has arranged to have one copy sent to each state medical association. Additional copies are available from the Institute for $5.00 each).

Osteopathy—No action was taken on a bill in South Carolina which would have given osteopaths the right to use and prescribe drugs and to perform surgery. At present, the licenses of osteopaths in South Carolina do not include these privileges.

A Georgia bill to study legislation relative to osteopaths, with the view towards possible revision of the state laws, was vetoed by the Governor.

New York enacted a measure which allows the Board of Medical Examiners to accept the certificate of the National Board of Examiners of Osteopathic Physicians, in lieu of their own state examination, for the purpose of licensure.

A bill in South Carolina, apparently aimed at a particular individual, would have given a license to practice osteopathy to any one licensed to operate a nursing home in the state, and who was licensed to practice the healing arts prior to 1938. This bill was passed, vetoed, and the veto was sustained.

Optometry—A bill was enacted into law in Kentucky which makes it mandatory for all state agencies and political subdivisions to accept and pay for the services of optometrists without discrimination between optometrists and "other persons" authorized by law to render the same professional services. The bill also made it mandatory for the testimony of optometrists to be accepted by state agencies with respect to any matter defined in the state law as constituting the practice of optometry.

Rhode Island enacted a measure allowing the establishment of non-profit service corporations similar to Blue Shield for optometric services.

A bill was vetoed in New York which would have allowed health insurance contract subscribers to have freedom of choice between physicians and optometrists where the contract provides for opthalmic services. A proposal which would make the fitting of contact lenses part of the practice of optometry failed of enactment in Michigan.

Licensure of Paramedical Groups — Numerous bills were introduced proposing the licensure, registration, and control of the many paramedical groups. No attempt will be made to list all of them in this report.

In New York, bills to license and set up boards for radiation technicians and medical technologists failed of enactment.

A measure providing for the examination and registration of persons engaged in the practice of massage therapy received no serious action in Georgia.

The masso-therapists have indicated that they will push for licensure in California in 1961, as will also the x-ray technicians.

A New York bill limiting the administration of physiotherapy by licensed physiotherapists to that prescribed in writing by a physician died in committee.

Anti-Cancer Quackery Legislation—In 1959, California passed the first anti-cancer quackery law. This statute gave the State Department of Public Health the power to investigate and test all drugs, medicines, and devices proposed to be used in the diagnosis or treatment of cancer. The Department has a Cancer Advisory Council to assist in its determinations. If, after investigation and testing, a remedy is found to be useless, the Department is given the power to order its users to cease and desist. If this does not bring an end to the practice, the Department may apply to the Supreme Court of the state for an injunction. The statute also forbids unlicensed persons to diagnose or treat cancer by the use of drugs, surgery, or radiation.

Such laws were also enacted this year in Kentucky and in Nevada. The Kentucky bill required the all-out effort of the state medical association inasmuch as it was opposed by the chiropractors, who attempted to have themselves exempted. In Kentucky, the treatment of cancer is now limited to licensed physicians, osteopaths, and dentists. It is likely that this type of legislation will arouse interest in many of the state legislatures during the coming year.

Health Insurance—The measures introduced in the state legislatures having to do with health insurance are too numerous to mention. The legislatures in New York, Massachusetts, Virginia, and Rhode Island were particularly active in this area.

The bill causing the greatest concern to the state medical association was in New Jersey. This measure would have allowed the Commissioner of Banking and Insurance to disapprove the rates of payment of any medical service corporation or medical service plan. The Commissioner would also have been given the power to obtain any

data or information from a medical service corporation that he needed in order to make such a determination. The bill was vigorously opposed by the state society on the grounds that it would, in effect, allow the government to set physicians' fees without any participation by the doctors in these determinations. No final action was taken by the legislature on this measure although it was favorably reported out of committee to the Assembly.

Bills to set up Commissions to study hospital charges, Blue Cross and Blue Shield rates, et cetera, received no action in Rhode Island and Michigan.

Compulsory Polio Immunization of School Children—Bills in New York and Kentucky requiring the compulsory vaccination of school children against polio received no action. The Kentucky State Medical Association took no position on the bill before its legislature, while the New York bill was opposed by the Medical Society of the State of New York. A similar bill in Michigan was enacted into law.

Exemption from Civil Liability for Emergency Care—California has a statute which exempts persons from liability for civil damages resulting from any mistakes or omissions committed by persons rendering emergency care, in good faith, at the scene of an emergency. Similar "Good Samaritan" laws were proposed in Mississippi, Virginia, and New York. The Virginia bill passed the Senate but not the House. The New York bill was killed in committee, reportedly due to opposition by various non-medical groups. New York expects to have its bill enacted during the 1961 session. The State Medical Society in Maryland also intends to introduce and support this type of bill in the next session of their legislature.

Miscellaneous—The Rhode Island legislature passed a resolution endorsing the Forand bill, and the Teamsters Union in California served notice that they will push for a Forand type bill in that state in 1961.

Physician lien laws failed to pass in New York and Louisiana.

A bill vigorously supported by the Kentucky State Medical Association was enacted setting up a medical care program for public assistance recipients.

Mississippi reduced the statute of limitations on malpractice from six to three years.

Bills in Rhode Island and Georgia, which would have allowed the services of chiropodists to be added to those services covered by medical services corporations, did not become law.

A bill was vetoed in New York which would have allowed podiatrists to administer narcotic drugs.

No action was taken in the South Carolina legislature on a bill which provided for the licensing of naturopaths.

Georgia enacted into law a measure setting up more humane commitment procedures, voluntary commitments, and in general improving the mental health statute in that state.

The Georgia legislature failed to pass a bill which would have clarified the tax status of property owned by professional organizations.

LEGALITY OF NON-THERAPEUTIC STERILIZATION DEFINED

Status of four states (Connecticut, Kansas, Montana, and Utah) proved that it is illegal to sterilize any person for other than eugenical or therapeutic reasons. As to the law on this subject in other states, there seems to be sharp disagreement among the medicolegal experts.

In *Christensen v. Thornby,* 192 Minn. 123, 255 N.W. 620 (1934), a vasectomy was performed upon a man whose wife could not have a child without hazard to her life. This was held not to be contrary to public policy even though the therapeutic necessity was on the part of the wife, not the husband.

A reported decision of a trial court in Lycoming County, Pennsylvania, squarely holds that a contract for a vasectomy, without therapeutic need, is not void because of public policy. In *Shaheen* v. *Knight,* 11 D. & C. 2d 41 (1957), the plaintiff, the father of four children, contracted with the defendant physician for a vasectomy because the plaintiff felt it to be economically necessary to limit the size of his family. Subsequent to the operation, the plaintiff's wife gave birth to another child, whereupon the plaintiff brought suit for breach of contract, seeking damages for the expense of rearing and educating the child. Held: action dismissed; the contract was not void because of public policy, but public policy forbade recovery of the damages sought. The court expressed the opinion that public policy does not recognize the "normal birth of a normal child" as damage.

Public Health

SURVEY OF NURSING ANESTHESIA IN MINNESOTA HOSPITALS

Recruitment, educational programs, consultation services and more complete record-keeping are some of the recognized needs in nursing anesthesia which are evident as a result of the findings of the nursing anesthesia study in Minnesota hospitals. Information on existing conditions was secured by survey of personnel, procedures, facilities and equipment in anesthesia services in general hospitals. The resultant data served as a basis for the present summary and recommendations.

The information reviewed here is taken from an article entitled, "Survey of Nursing Anesthesia: Personnel, Policies and Procedures in Minnesota Hospitals, 1956-57," by Martha J. Lundgaard, CRNA, Helen L. Knudsen, M.D., M.P.H., William C. Harrison, M.D., M.P.H., Bernard A. Wolcyn, Ph.D., and Robert H. White, Ph.D., which appeared in *The Journal of the American Association of Nurse Anesthetists* for June and August, 1960.

An earlier program, supported by the W. K. Kellogg Foundation from 1950-55 indicated the need for more intensive study of paramedical services and the establishment of baseline data which will allow future comparisons. Such will indicate what progress may have been made in providing improved anesthesia services in the State. The reported nursing anesthesia survey was conducted by the Hospital Services Demonstration staff of the Minnesota Department of Health. The project was facilitated by the cooperation of the Anesthesia Advisory Group, consisting of the Minnesota State Medical Association with its Committee on Anesthesiology, the Minnesota Society of Anesthesiologists, the Minnesota Association of Nurse Anesthetists, the Minnesota Hospital Association and the Minnesota Department of Health.

The basic information covering a one-year period was obtained during 1957-58 through personal interview with anesthesia personnel and/or administrators of 182 general hospitals in Minnesota. The questionnaire form consisted of 144 items of which 119 were machine processed to provide data for interpretation. The data was grouped according to five bed-capacity categories (0-20, 21-30, 31-70, 71-130, 131 and over). Forty-five hospitals were included in cities of 10,000 and more population, while 137 hospitals were located in communities of less than 10,000.

In this study, five classifications based on training were used to differentiate anesthesia personnel:

Certified Registered Nurse Anesthetist (CRNA)—a registered nurse certified as a nurse anesthetist by the American Association of Nurse Anesthetists (AANA) on basis of examination since 1945 or experience prior to 1945.

Nurse Anesthetist (non-CRNA)—A registered nurse formally trained in anesthesia in an AANA-approved school, but not certified in anesthesia.

Short-Trained Anesthetist—A registered nurse with anesthesia training in a school not approved by the AANA.

Job-Trained—A registered nurse with only on-the-job training in anesthesia.

Other — Personnel with less than registered nurse training.

The major findings of the survey are summarized as follows:

1. Seventy-five per cent of the 182 hospitals surveyed were in municipalities of less than 10,000 population.

2. Medical anesthesiologists supervised anesthesia services in seventeen per cent of the hospitals.

3. There were 615 anesthesia personnel in the 182 general hospitals in Minnesota in 1956-57. This number does not include the thirty-one resident anesthesiologists and fifty-four student nurse anesthetists in training. Of these 615, there were 447 employed full-time in 125 hospitals. There were 168 part-time anesthesia personnel in 112 hospitals. Hospitals with no full-time people had at least one part-time anesthesia person. Of the 615 anesthesia personnel, fifty-six were medical anesthesiologists, nineteen were physicians with some training in anesthesia, 238 were CRNA's, 278 were RN's who were not certified in anesthesia and twenty-four had no anesthesia training.

4. Approximately one-half of the hospitals (92) in the State did not have the services of either an anesthesiologist or a certified registered nurse anesthetist. The training and background of the individuals providing the anesthesia services in these hospitals ranged from RN's who may have had formal anesthesia training but who have not been certified, to untrained nurse aides.

5. Almost all hospitals employed full-time RN's as nursing personnel in surgery. In addition, slightly over one-third employed practical nurses, and more than two-thirds used nurse aides in the operating rooms.

6. The average maximum monthly salary for CRNA or CRNA eligible was $479.58 in comparison to $346.91 for anesthesia personnel without formal anesthesia training. This is the stated amount paid to anesthesia personnel and does not include pay for call or overtime duty.

7. Full-time anesthesia personnel averaged 6.5 scheduled duty hours per day and 29.2 scheduled hours per week. In addition, the average number of days of first call per week was 4.8. In slightly over one-half of the hospitals, the anesthesia personnel were on call every day.

8. Nearly two-thirds of the hospitals (115) expressed a need for consultant services in nursing anesthesia.

9. RN's untrained in anesthesia techniques administered anesthesia at times in the obstetrical departments of 166 hospitals.

10. One hundred and fifty-six hospitals had gas machines in the operating rooms. Nearly all of the hospitals without machines had fewer than twenty beds. All but two hospitals had suction machines available.

11. Airways of several types and sizes were used in 175 hospitals (97 per cent) while 144 hospitals (80 per cent) had endotracheal equipment available.

12. Intravenous fluids were given routinely in the operating rooms of 165 hospitals (92 per cent) and three-fourths of these used 5 per cent dextrose with distilled water.

13. One hundred and fifteen hospitals had one operating room and sixty-seven had two or more, providing 424 operating rooms in the hospitals studied. A total of 203 delivery rooms was reported.

14. Over four-fifths of the hospitals indicated they had one or more fire or explosion prevention features in the operating rooms. Ungrounded electrical systems, explosion-proof equipment and conductive floors were the most frequently observed.

15. All hospitals gave some type of anesthesia. The most commonly administered anesthetics in surgery were drop ether, local and pentothal sodium. Local block, trilene or trimar were most commonly used in obstetrics. All local, spinal and caudal anesthetics were administered by anesthesiologists or other physicians.

16. Two separate anesthesia records were maintained in nearly all hospitals. Four-fifths of the hospitals (146) used individual anesthesia record form on the patients' charts; the rest recorded anesthesia information on the operative forms or on nurses' bedside notes. In addition, anesthesia information was maintained in various types of record books in all but two hospitals.

17. Nearly three times as many anesthesias were administered to surgical patients as to obstetrical patients. The number of surgical anesthesias was proportionately increased over obstetrical anesthesias as the size of the hospital increased. A total of 212,776 surgical anesthesias was administered in 171 hospitals. More than 145,930 (67 per cent) of these were given in twenty-nine hospitals with 131 beds or more. A total of 78,009 obstetrical anesthesias was administered in 169 hospitals of which 40,977 (53 per cent) were given in twenty-seven hospitals with 131 or more beds.

The following broad recommendations based on the findings of the survey have been developed to suggest programs to achieve better anesthesia services in Minnesota hospitals.

Recommendations

1. An expanded program of recruitment is needed to alleviate the shortage of formally trained nurse anesthetists.

2. Plans should be developed to encourage scholarships for anesthesia training of registered nurses in exchange for a year or more of their services.

3. Educational programs should be established for the presently employed anesthesia personnel in surgery and obstetrics who lack formal anesthesia training. These may take the form of institutes, conferences, refresher courses, consultant visits or other suitable methods.

4. Educational materials and/or programs for hospital boards and administrators should be provided to inform them of the essential features of an adequate anesthesia service.

5. The quality and quantity of anesthesia information being recorded in Minnesota hospitals should be improved and better organized in the interest of improved patient care.

6. Hospital sharing of available anesthetists should be encouraged whereby those who are formally trained in anesthesia can extend their services to nearby hospitals in need of such help.

7. In the construction, remodeling and maintenance of facilities greater consideration should be given to making hospitals safe from explosion and fire. More recovery rooms are needed in the existing larger hospitals.

8. If a recovery room is not planned in the smaller hospital, an emergency cart containing essential post-operative and cardiac-arrest resuscitation equipment should be supplied.

An oral presentation of this material preliminary to the final report was made to the Anesthesia Committee of the Minnesota State Medical Association in May, 1959. Since then a completed report was sent to members of the 1960 House of Delegates of the above body. At the Annual Meeting in Rochester in 1960, the recommendations were acted upon and approved.

Proposed programs based on the recommendations have been developed and were submitted to the Minnesota Patient Care Commission for consideration July 22, 1960. Plans are now being developed to place the program into effect beginning in the fall of 1960.

The Minnesota Patient Care Commission composed of representatives from medicine, hospitals, public health and related groups serves in an advisory capacity for this and similar activities related to patient care services.



State Fair Goers Learn About High Blood Pressure

Free height, weight and blood pressure tests were given to a record total of 7,878 persons who attended the 1960 Minnesota State Fair.

Approximately 10 per cent or a total of 730 persons checked during the ten-day event were advised to consult their personal physicians for further readings. The names of these persons, together with their blood pressure readings, have been referred to the individual's physician. Blood pressure readings were given by members of the Academy of General Practice.

Another popular feature of this year's project was the daily presence of representatives of the Minnesota Dietetic Association to answer dietary questions for State Fair goers. An estimated total of 50,000 pieces of printed health materials, including personal and family health records, calorie charts and *The Healthy Way to Weigh Less* were distributed to the public. Twin City student nurses' groups also assisted in the project.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

THE IMPORTANCE OF THE PUBLIC IMAGE VERSUS REALITY

The public image of doctors and the AMA will play a big role in the future course of political and public behavior involving the medical profession, declared Pierre Martineau, Director of Research and Marketing of the *Chicago Tribune,* in the opening session of the American Medical Association's 1960 Public Relations Institute in Chicago. Citing examples of people's reactions to certain products or brand names, Mr. Martineau said:

"Every brand that is well known at all is defined in the public mind partly by what it is but also, very importantly, by sets of psychological associations which may or may not be true. These persist almost like a halo attached to the product. Both of these constitute the brand image and it is to this image that people react in reality. All of our stimuli from the outside are filtered through the images that we have of a particular situation."

It's Word of Mouth that Counts

Images are formed partly by experience but mostly by word of mouth, he said, and once they are formed they become stereotypes that are extremely difficult to alter. We bend actuality to fit the images; we believe what we want to believe.

Mr. Martineau pointed out, however, that images can be modified, but not simply by supplying facts and information. It is imperative, he said, to come to grips with the problem of the doctor and the AMA as they really are and as they are seen by the public, politicians and intellectuals.

Worthiness of Respect and Attention Challenged

Gerald J. Skibbins of Opinion Research Corporation, Princeton, New Jersey, panel moderator, declared that all of our authorities and authority symbols are under major challenge to prove that they are worthy of the respect and attention of the people. A good, strong organization image he said, requires positive, constructive actions that are then well interpreted. He added that bad works also must be explained and remedied.

Here's How People See Doctors

Mr. George Brandenburg, Chicago, Midwest Editor of *Editor & Publisher,* a speaker on the first panel dealing with the subject of "How People See Doctors," reported that relations between physicians and newsmen have been improving steadily in recent years and have never been better than they are today. The real progress, he said, can be credited to doctors "who have learned to be articulate and who have demonstrated to their fellow physicians that you don't have to be a quack to get into print."

However, Mr. Brandenburg added, all is not sweetness and light, and there is no room for complacency. He said there still are too many local instances of professional envy toward colleagues, adherence to the "tradition of silence" and attitudes which create the image of "membership in a secret society." He also urged physicians to take a more active part in civic and community affairs.

Here's How the Doctor Sees Himself

The second speaker, Dr. Russell B. Roth, Erie, Pennsylvania, member of the AMA Council on Medical Service, presenting the image of the truly representative physician as he sees himself, said the "doctor's doctor" has been stripped of the scientific insulation of medical school and has had to face up to countless practical problems and controversies for which his education did not prepare him. Primarily, he is interested in exercising his medical talents, and he would love to be left alone just to heal the sick.

Being paid is secondary thought of the representative physician, Doctor Roth said, and he is proud of his contribution of free services to the needy. He particularly resents the charge of money-mindedness, as he compares his hourly income with that of plumbers and bricklayers. In the gallery of images in the community, he feels that his shines a little more brightly than others.

TV Has Favorable Medicine Image

Herbert A. Carlborg, New York City, Director of Program Practices for CBS Television, reported that experience in the television medium reflects a very favorable image of medicine from the standpoint of both producers and audience. CBS is concerned with presenting the symbol of the doctor in the best possible and most truthful light within the limits of dramatic license, he said, and no material is allowed to glorify negative elements. However, he suggested, television probably should consider doing some programs which, instead of showing a constant pattern of perfection in medicine, would point up some of the controversy that may exist within the profession.

Here's Why People See Doctors As They Do

Members of the second panel, concerned with why people see doctors as they do, were Professor Raymond Mack of the Northwestern University Department of Sociology; Dr. Nicholas Dallis of Scottsdale, Arizona, creator of the "Rex Morgan, M.D." and "Judge Parker" syndicated comic strips, and James E. Bryan of Stamford, Connecticut, consultant in Medical Administration, prepayment and public relations.

Professor Mack expressed the opinion that undoubtedly there are some massive, unfavorable public images of physicians and of the American Medical Association. He suggested that medicine examine its own images of other people, and he questioned the wisdom of placing the socialist label on those in the opposition. We expend too much energy in not liking changes in our social and economic structure, he said, whereas the important thing is how we regulate the so-called "supplementary contracts" involved in those changes.

People Have Double Image of Doctors

Doctor Dallis, who was a practicing psychiatrist for ten years, pointed out that people have two distinct images of the doctor. Their unconscious image of what they want their doctor to be is actually that of Jesus Christ, the Healer. The conscious, realistic image is not one but many, he said, and these vary according to a person's educational, cultural and economic background.

The past twenty-five years of public education about medicine have caused many people to question whether "the doctor's word is law," Doctor Dallis explained. The image also has been affected by the fact that a high proportion of medical school graduates today are married, he said, with the result that young doctors enter practice with more economic responsibilities and greater business ability than those of twenty years ago. The advent of the so-called wonder drugs, making treatment quicker and more impersonal, also has changed the physician-patient relationship, he added.

Do They Desire to Escape Reality?

Mr. Bryan questioned whether "this agonizing concern with our images is not really just another escape device by which we can avoid examining the reality of ourselves." If either our interior or exterior images depart too far from actuality, he declared, "we're likely to be in deep trouble." To treat the image rather than the reality, he added, is to treat the symptom instead of the disease.

A central factor in the tarnished popular image of the modern physician, Mr. Bryan emphasized, is that of "remoteness," the lack of personal involvement between patient and doctor. The average physician has lost some of the art of medicine, he said, and there also is "a profound conflict between the profession's social outlook and the popular ideologies of our day." The profession, he declared, has been far too slow in recognizing the fact that modern medical care is universally demanded as a basic human right.

Minnesota Blue Shield

Minnesota Blue Shield recently announced that individual farmers could apply for its health care plan at group rates, in recognition of agriculture as an industrial group, comparable to Blue Shield groups in other occupational fields.

Dr. Richard R. Cranmer, executive director of Minnesota Blue Shield, said, "Under this program, we recognize the members of Minnesota's farming industry as a group in themselves and are making available to them the same kind of group contract at group rates which business and industry have long received."

He called the action by Minnesota Blue Shield of special importance, because farmers, as a group, tend to have less health care protection than other segments of the population.

Yet, he said, farmers often have greater need for it than some other groups, partly because of the relatively hazardous aspects of their occupation as well as the heavy burden which prolonged hospitalization places on the farm family.

"With the head of the family or other needed adult members absent due to illness, farm operations may come to a standstill, with these losses added to the hospital costs," he said.

Dr. Cranmer added that the new group plan for farmers was a further step in Blue Shield's community-wide approach to the problem of health care protection.

"We regard it as a responsibility of Blue Shield to offer the broadest possible coverage to all groups of the community, and certainly, the farm population is a significant group."

* * *

Minnesota Blue Shield's diagnostic benefits represent a positive step toward the alleviation of one of the most serious problems besetting the health care field. This is the three-fold problem of overcrowded hospitals, rising hospital costs and unnecessary utilization of hospital insurance.

By providing substantial allowances for two of the most expensive items among out-patient services—diagnostic x-ray and laboratory services—Minnesota Blue Shield is encouraging patients to see their doctors sooner than otherwise. In most cases, this permits the physician to detect and control many conditions before hospitalization becomes necessary.

Patients, as all doctors know, have a tendency to delay visiting their doctors because Blue Shield, heretofore, did not cover x-ray and laboratory services when rendered on an out-patient basis. Many patients, who previously waited until they were hospitalized to obtain diagnostic services they could have received while still ambulatory, will now go to their doctors' offices instead.

This has been borne out by experience with prepayment plans in New York City. A study was made of two groups of subscribers there—one group having hospitalization coverage and in-hospital medical coverage, the other having hospitalization coverage, medical care coverage, and in-patient benefits—plus benefits for diagnostic services on an out-patient basis.

Among members of the second group (who had diagnostic benefits), there were 20 per cent fewer hospital admissions than among the group with in-patient medical coverage only. In some areas of New York City, admissions among the second group were as much as 40 per cent lower than from the first group. But the overall average was about 20 per cent fewer admissions among subscribers with diagnostic and x-ray benefits.

The study confirmed, without doubt, the great value of diagnostic coverage in the whole public health picture. Not only does it "help the patient stay well," but, by alleviating hospital overcrowding and unnecessary utilization of hospital insurance, it can, in the long run, contribute to lowering of hospital costs.

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Medical-Legal

HENNEPIN COUNTY MAN SENTENCED FOR VIOLATING BASIC SCIENCE LAW

On July 28, 1960, Robert Paul Selisky, thirty-six, 5260 Hampshire Ave. N., Crystal, Minnesota, was sentenced for violating the basic science law, by the Hon. Harold N. Rogers, Judge of the District Court of Hennepin County, to a term of one year in the Minneapolis Workhouse. However, Judge Rogers stayed the execution of the sentence for one year on condition that the defendant voluntarily enter the Willmar State Hospital for treatment. Selisky must remain in the hospital until discharged, but under the terms of his probation he cannot leave the hospital before the expiration of sixty days from the date of entering the institution. After the defendant is discharged from the hospital, he will be on probation under the supervision of the Hennepin County Probation Office for the remainder of his one-year term. Selisky previously, on July 20, had entered a plea of guilty before Judge Rogers to an information charging him with violating the basic science law by attaching the title of doctor to his name, indicating and with a design to indicate that he was engaged in the practice of healing. Selisky entered the Willmar State Hospital on August 14, 1960.

On July 2, 1960, Officer Walter Bassett, of the Crystal Police Department, arrested Selisky a short time after he inquired at the drug counter in the Medical Center Pharmacy, 5640 West Broadway, Crystal, in order to find out whether a certain prescription had been compounded. Officer Bassett had been informed by an alert pharmacist that a person impersonating a Minneapolis physician had telephoned the pharmacy ordering 100 5-milligram dexedrine tablets for an alleged patient. When Selisky asked at the drug counter for the prescription, the pharmacist called to the officer, which caused Selisky to realize that he was going to be arrested and he then started walking at a rapid pace toward the door. When Officer Bassett reached the door, the defendant had run into an open area and when he disregarded an order to halt, the officer fired several shots into the air. Selisky continued running so the officer placed his gun in his holster and pursued him through waist-high weeds and into a swampy area where it was finally necessary to tackle the defendant in order to arrest him.

The defendant has three prior convictions, two of them being in the Municipal Court of the City of Minneapolis. On September 1, 1954, he was held for police officers at the point of a gun by a Minneapolis man who claimed that the suspect had knocked down his porch railing. Although Selisky was incoherent and acted as though he had been drinking, no odor of alcohol could be detected from his breath and he later admitted to the police that he had been taking seconal and benzedrine. On the following day, the defendant was convicted by the Court of the offense of disorderly conduct, whereupon he was sentenced to sixty days in the Minneapolis Workhouse, the sentence being stayed and the defendant placed on probation for one year. However, on September 18, 1954, Selisky was again arrested, his probation was revoked and he was committed to the workhouse. On August 26, 1956, Selisky was arrested on a charge of violating the City Drug Ordinance in Minneapolis. The defendant was convicted of that offense and Judge Lindsay G. Arthur sentenced him to a one-year term in the workhouse but stayed the execution of the sentence for the same period of time.

Selisky has one prior conviction in Hennepin County for violating the basic science law, the circumstances and the nature of his conduct in that case being very similar to the one for which he was sentenced on July 28, 1960. On November 2, 1959, Hennepin County District Judge John A. Weeks sentenced the defendant to a term of one year in the Minneapolis Workhouse but stayed the execution of the sentence and placed Selisky on probation for one year. Selisky, who was formerly employed by a Minneapolis musical records firm, holds no license to practice any form of healing in the State of Minnesota and has not taken training in medicine.

J. P. Medelman, M.D.
Secretary, Minnesota State Board of Medical Examiners

CORRECTION

Due to an oversight, credit for the summary of action, "Detroit (Michigan) Ex-Convict Posing as Physician Convicted on Narcotic Charge," failed to be given in the September issue. This information was made available by the Minnesota State Board of Medical Examiners, J. P. Medelman, M.D., Secretary.

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In Memoriam

CHARLES H. PIERCE

Dr. Charles H. Pierce, Wadena physician, died September 12, 1960, in Minneapolis. Doctor Pierce was seventy-two years of age at the time of his death.

He was born at Charter Oak, Iowa, in 1888 and received his preliminary education at Park Rapids High School, Park Rapids, Minnesota. He then went on to Hamline University and the Northwestern University School of Medicine, from which he graduated in 1914. He established a practice of medicine in Wadena in 1918. He established the Wadena Clinic in 1927 with Dr. John Grogan, Dr. Harry Frost and Dr. A. F. Schuft (dentist) of Verndale.

Doctor Pierce was a member of the Upper Mississippi Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Survivors include his wife Alfilda, Wadena; two daughters, Mrs. Mary Stabile, Douglaston, New York. and Mrs. Virginia Sheldon, Alexandria, Minnesota; three sons, Dr. Robert Pierce, Renville, Sam Pierce, Wadena, and Attorney Charles Pierce, Pueblo, California; and two brothers, Dr. Willard Pierce, Bismarck, North Dakita, and Walter Pierce, in Holland.

MELVIN VIK

Dr. Melvin Vik, assistant superintendent of the Cambridge State School and Hospital, died September 16, 1960. He was sixty-three years of age at the time of his death.

Doctor Vik was born in Clarkfield, Minnesota, in 1896 and obtained his preliminary education at Clarkfield High School, St. Olaf College in Northfield and the University of Minnesota in Minneapolis. His medical education was obtained at the University of Minnesota Medical School, from which he graduated in 1924.

Doctor Vik practiced medicine from 1924 to 1948 and then served on the staff at the Anoka State Hospital until moving to Cambridge in 1956.

He was medical director of the Physical Medicine and Rehabilitation Service at the Cambridge State Hospital, a member of the East Central Minnesota Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Survivors include his wife, Mercedes; a sister, Mrs. Olivia Hendrickson, Cresco, Iowa; and four brothers, Theodore, St. Anthony, Idaho; Henrick, Sioux Falls, South Dakota, and Olaf and Reuben, both of Clarkfield.



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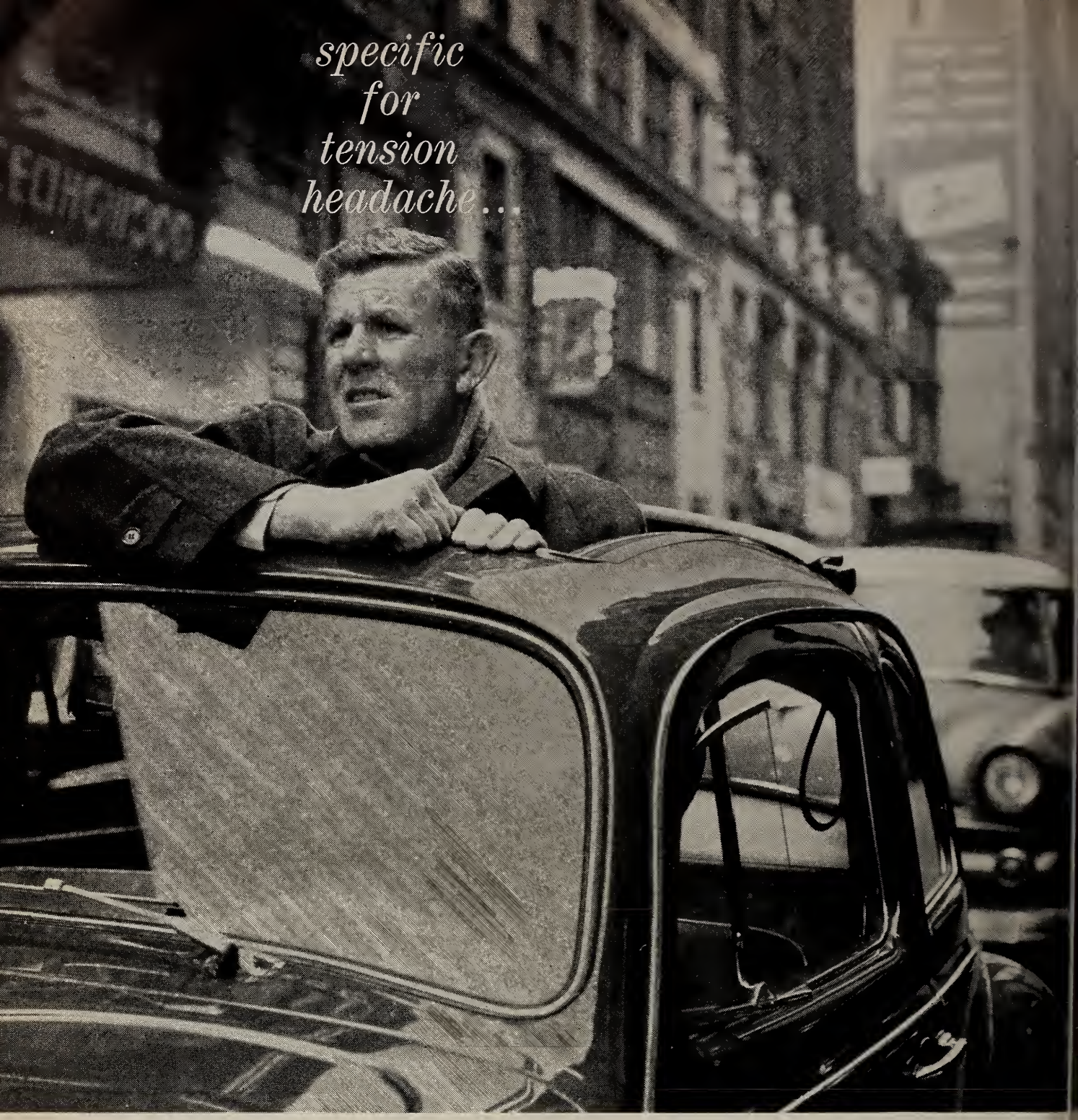
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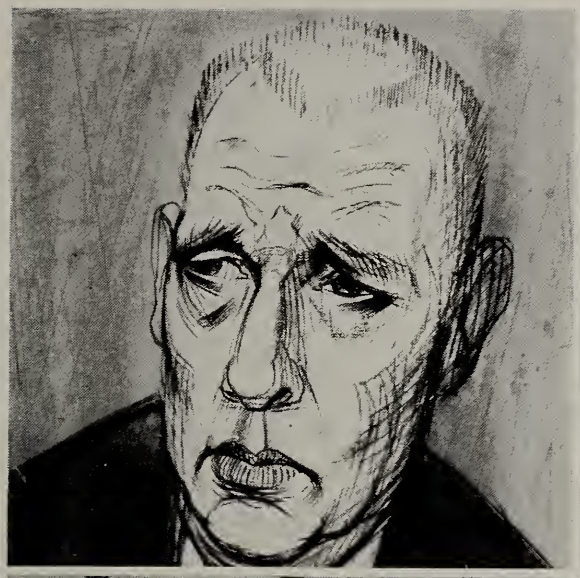
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Communications

CONTRIBUTIONS OF $780,000 MADE TO PROJECT HOPE BY DRUG FIRMS

Fifty-two of the nation's leading prescription dru manufacturers have contributed in excess of $780,000 i products and cash to Project HOPE, according to Dr William B. Walsh, president of the People-to-Peopl Health Foundations, sponsor of the project. Over $100, 000 of the companies' contributions were in cash. Pro duct values were computed according to manufacturers wholesale prices.

The donations, coordinated by the Pharmaceutica Manufacturers Association, came from PMA membe companies.

"The support of the member companies of PMA ha earned the unending gratitude of the people of Indonesi and Vietnam," Dr. Walsh said, "And it serves as a example of enlightened generosity to our own fellow citizens. This response has earned the deepest gratitud of all of us connected with Project HOPE."

A part of President Eisenhower's People-to-People pro gram, Project HOPE sent a 15,000-ton hospital ship, th *SS HOPE I,* to Southeast Asia on September 22. Staffe with American doctors, nurses, and medical technicians the floating medical center will bring modern medica knowledge and techniques to the medical and healt professions of newly developing countries throughout th world.

"As a non-government program, Project HOPE coul only succeed with the cooperation and backing of al segments of American society," Dr. Walsh said. "Th response of the American drug industry, many othe industries, businesses, and groups, American Labor, an the American public is proof that our confidence in th conscience of American was warranted."

Dr. Walsh also reported that contributions totalin many thousands of dollars had been raised from non PMA members in the ethical drug industry and fro proprietary drug companies.

Dr. Austin Smith, president of PMA, expressed hi gratitude to member companies for their support an pointed out that "the final success of Project HOPE wil depend on continuing support of all facets of Americar industry and the general public."

"I am informed that HOPE has received more tha $2 million of the $3.5 million needed to operate the shi for its first year," Dr. Smith said.

NEW DIVISION OF OCCUPATIONAL HEALTH

The strengthening of the Public Health Service' nation-wide program to protect the health of America workers through the creation of a new Division of Occu pational Health has been announced by the Surgeo General.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

The new division, which replaces the Occupational Health Program, follows the recommendation of the Study Group on Mission and Organization of the Public Health Service, designed to place greater emphasis on all types of environmental health hazards. It provides for "long-needed increased efforts" in the occupational health field as recommended to the Surgeon General by the Study Group. Dr. Harold J. Magnuson has been named chief of the new division.

To keep pace with a changing technology and multiplying hazards in the work environment, the division will carry out an expanded research program directed at developing better techniques, materials, and equipment for use in the prevention, diagnosis, and treatment of occupational disease. Major research efforts will be intensified in toxicology and in related fields of clinical medicine, engineering, chemistry, and physics. In addition, the physiological and psychological factors in the work environment will come under more penetrating study.

Greater emphasis will also be focused on the training of personnel in occupational medicine and nursing and in industrial hygiene to meet the needs of this rapidly growing field. The Division will work with academic institutions and other groups to help develop the necessary professional resources.

A third area of major expansion is in state aid services, designed to support and assist official agencies in the development and operation of occupational health programs throughout the nation.

The division will also be responsible for stimulating effective community and industrial efforts to supply occupational health services.

Research and technical services, as well as training activities, will be carried out at Cincinnati, Ohio. State aid activities, occupational health nursing consultation, and studies and consultation relating to employee health programs will be centered at the division's administrative headquarters in Washington, D. C.

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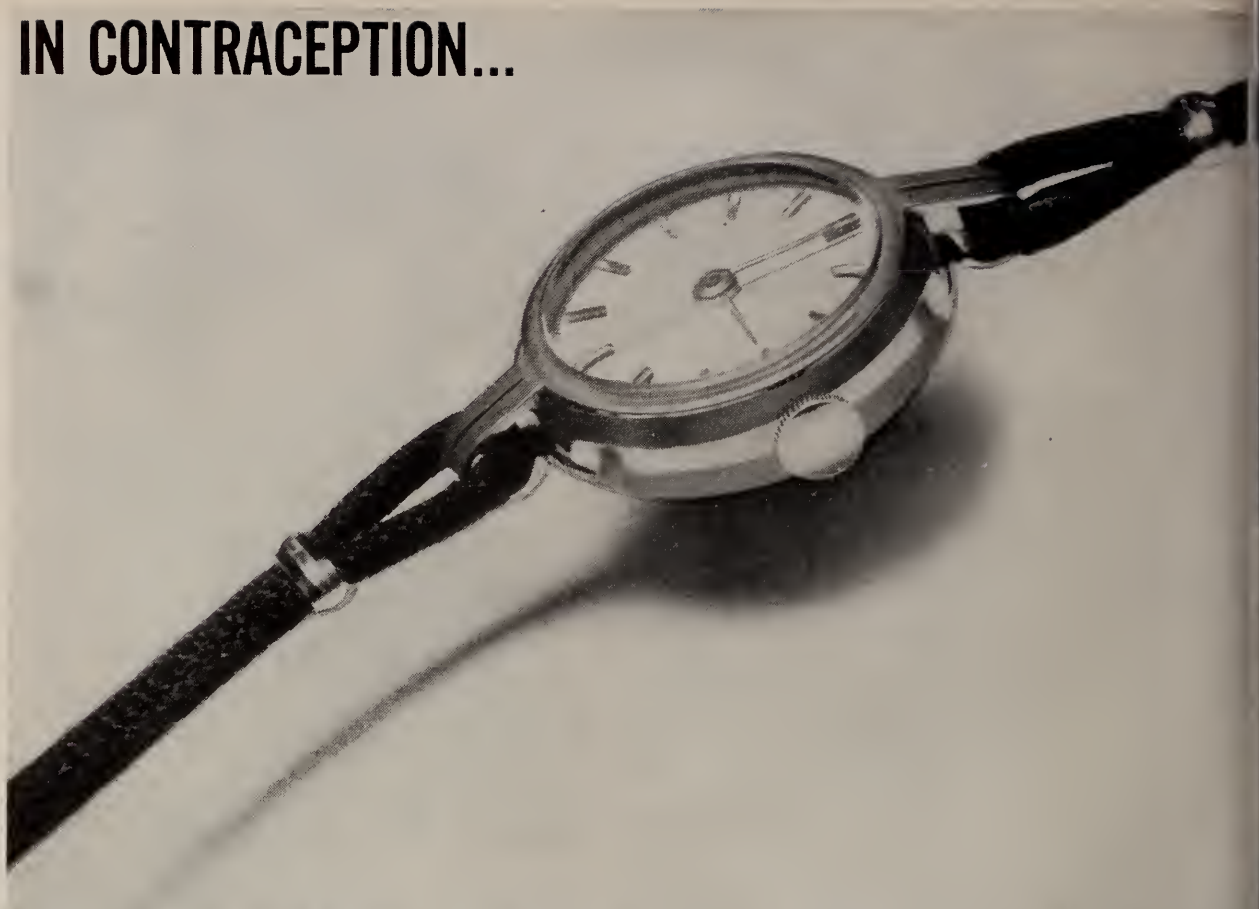
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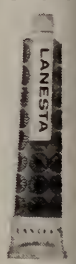
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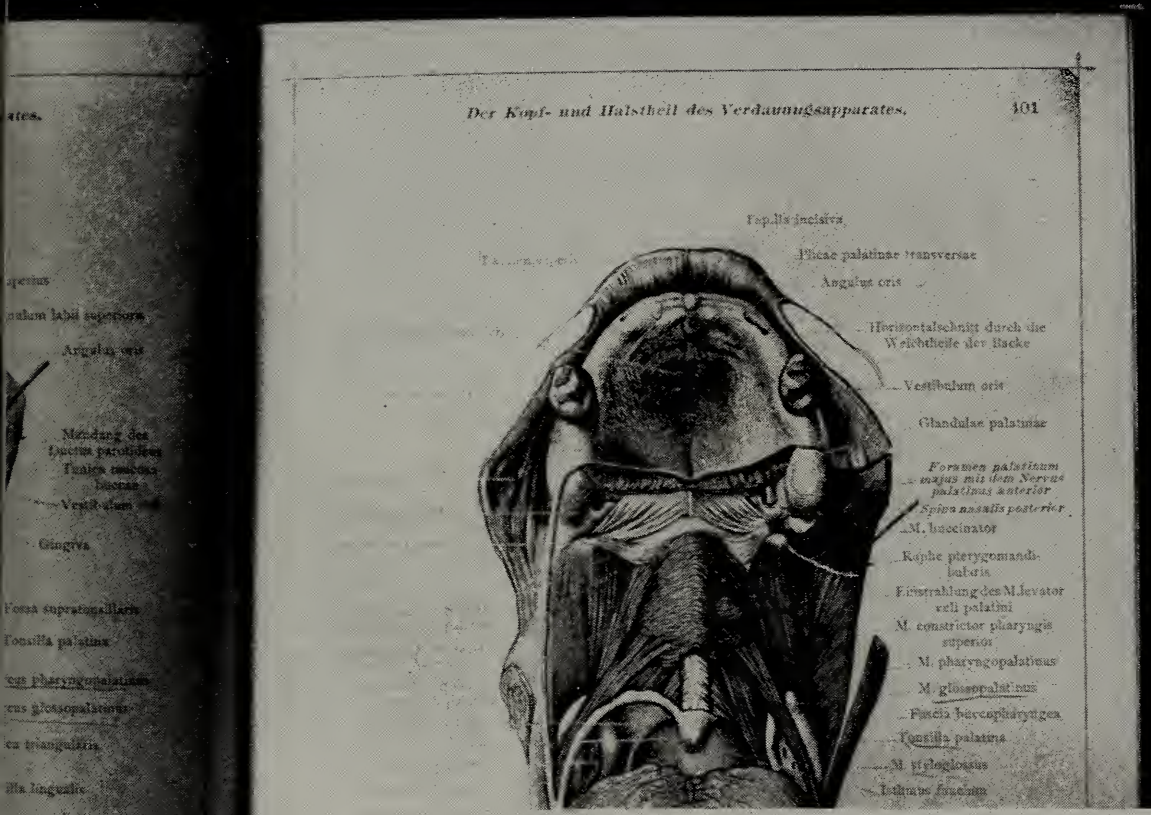
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The Physician's Diary

Dr. Mansur Taufic, a native of Brazil, became an American citizen in naturalization ceremonies in Minneapolis. Doctor Taufic has an established practice as a general surgeon in Austin. He came to the United States on a student visa in 1949 and received a permanent visa in 1957. A graduate of the University of Brazil Medical School, Doctor Taufic studied six and one-half years with **Dr. Owen Wangensteen,** University of Minnesota Medical School surgical division chief.

* * *

New officers of the Southern Minnesota Medical Association are **Dr. Charles G. Sheppard,** Hutchinson, president; **Dr. Grant R. Diessner,** Rochester, first vice president; **Dr. Ed Richardson,** St. Paul, second vice president; and **Dr. John J. Eustermann,** Mankato, secretary-treasurer. **Dr. E. Covell Bayley,** Lake City, is the immediate past president. Guest speaker at the annual dinner was **Dr. Edward M. Litin,** Mayo Clinic. He spoke on "Hypnosis in Medicine—Fact or Fancy."

* * *

A former Thief River Falls physician, **Dr. M. A. Mochal,** has joined the staff of the Worthington Clinic. He is a graduate of the State University of Iowa Medical School and completed three years of residency in internal medicine at the University Hospital and the Veterans' Administration Hospital in Iowa City.

* * *

Dr. Waltman Walters, senior surgeon of the Mayo Clinic, retired October 1, after forty years in the Mayo Clinic. Doctor Walters, a graduate of Rush Medical College of the University of Chicago, is one of the founders of the American Board of Surgery, Inc. Doctor and Mrs. Walters are making an extended study trip to important surgical centers and cancer research hospitals and institutes in the Far and Middle East. They will return to Rochester next June.

* * *

St. Paul physician, **Dr. Gordon R. Kamman,** and fifteen other members of the Academy of Forensic Sciences met with the Japanese Medical Correctional Association in Tokyo. Doctor and Mrs. Kamman were in Asia from July through October.

* * *

Among seven Rochester doctors awarded a total of $24,300 for research are: **Dr. John F. Fairbairn, II,** Consultant in Medicine, Mayo Clinic, for "The Vascular Anatomy and Pathology of the Foot in Arteriosclerosis Obliterans"; **Dr. William H. Weidman,** Section of Pediatrics, Mayo Clinic, for "The Experimental Induction of Congenital Cardiac Defects"; **Dr. Hiram W. Marshall,** Assistant to the Staff in Physiology, Mayo Foundation, for "Application of Fiber Optics to Catheter-Tip Densitometry and Oximetry, and to Cardiovascular Endoscopy"; and **Dr. F. H. Ellis, Jr.,** Head of a Section of Surgery, Mayo Clinic, for "Development of a Synthetic Intracardiac Valve."

* * *

The Fortieth Annual Meeting of the Northern Minnesota Medical Association was held in Crookston recently. The program included scientific sessions at Bethesda Hospital. A banquet was held at the Minakwa Country Club with **Dr. O. J. Behr** of Crookston, president of the Association, presiding. **Dr. Clarence Jacobson** of Chisholm, president of the Minnesota State Medical Association, was one of the speakers. **Dr. C. L. Oppegaard,** Crookston, was general chairman of local committees.

* * *

Dr. Sidney O. Hughes, Winona, has been informed of his election as an associate of the American College of Physicians. He is a graduate of the University of Pennsylvania School of Medicine and served a three-year residency at Presbyterian Hospital in Philadelphia.

* * *

The Lenont-Peterson Clinic of Virginia has announced the association of **Dr. Charles J. Mock** with the medical staff in the Department of Surgery. Doctor Mock is a board-certified general surgeon, formerly on the staff of Presbyterian-St. Luke's Hospital in Chicago and an



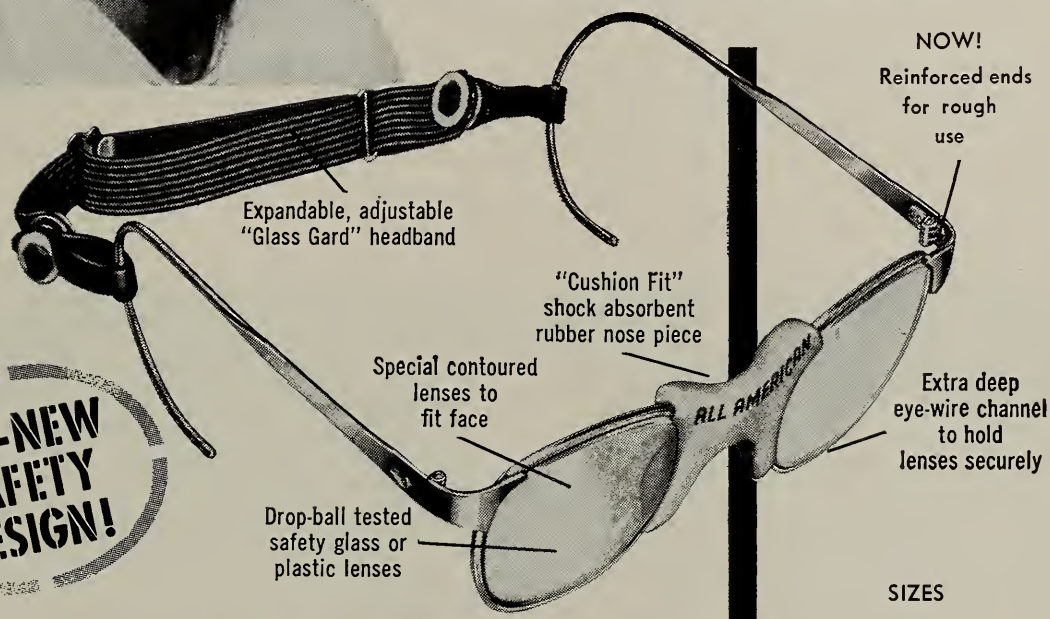


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instructor in surgery at Northwestern University Medical School and the University of Illinois School of Medicine.

* * *

Dr. Donald Heckman has announced the opening of an office in Owatonna for the practice of pediatrics. He is a graduate of Georgetown University and the Medical School of the State University of New York.

* * *

Dr. Philip S. Hench, emeritus member of the Mayo Clinic staff and a Nobel prize winner in 1950, his wife and son were recent visitors of Europe. While there, they attended the Summer Olympic games in Rome.

* * *

Two Mayo Clinic physicians presented papers at the meeting of the International Society of Hematology in Tokyo, Japan. **Dr. David G. Hanlon** and **Dr. Charles A. Owen** were accompanied by their wives. Doctor Owen spoke on the mechanism for the absorption of iron from the intestine and also discussed a new study on one reason why certain patients get clots in blood vessels. Doctor Hanlon's first presentation was one written by him with **Dr. M. M. Hargraves** on "Leukemia and Lymphoma—Environmental Diseases?" His other paper was entitled "Changing Picture in Acute Leukemia."

Dr. George M. Crow has joined Dr. **R. D. Hanov** and **Dr. C. B. Will** in the practice of medicine at t medical building in International Falls. He is a grad ate of the University of Minnesota Medical School a interned for one year at Mercy Hospital, Toledo, Oh He is a son of **Dr. E. R. Crow** of Walker.

* * *

Flying down to Tulsa, Oklahoma, for the annu meeting of the Flying Physician's Association were I **R. W. Schulz,** of Fairmont, and **Dr. H. A. Christians** of Jackson. They used Doctor Schulz's private pla for the trip.

* * *

Dr. Frank H. Krusen, Mayo Clinic, who headed t International Congress of Physical Medicine in Was ington, D. C., took office as president of the Intern tional Federation of Physical Medicine at the closi session of the meeting. Doctor Krusen has been pre dent of the federation three times.

* * *

A native of Poland, **Dr. Julian Pawlyszyn,** has join the staff of the Fergus Falls State Hospital. He has be at the Anoka State Hospital for the past two years.

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and vertigo
relieved in
circulatory disturbances
of the
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Ulen, Minnesota, will soon have a doctor of its own. ans for the new medical center erected there include npletion the end of this month. **Dr. Gertrude Sax-n,** presently of Moorhead, has accepted the position the new clinic.

* * *

The Mayo Foundation Alumni Association held its rty-sixth annual meeting in Rochester. **Dr. H. J.** ien was general chairman of the event. Officers of the umni Association include **Dr. L. Raymond** Scherer, nneapolis, first vice president.

* * *

Twenty-five years of devoted service to the people of tkin County were recognized as the Community Hos-al Auxiliary members honored **Dr. H. T. Petraborg.** $2500 check to the Hospital Board was presented for dication of the new nursery to Doctor Petraborg.

* * *

Dr. Herman E. Drill, Hopkins, president of the Min-sota Medical Foundation, recently awarded scholar-ps to thirty-one University of Minnesota Medical hool students. This year's awards are the largest group r presented, and bring to 214 the number of schol-hips granted by the Foundation since the program was unched twelve years ago. Total funds for scholarships arded during this period is $109,500.

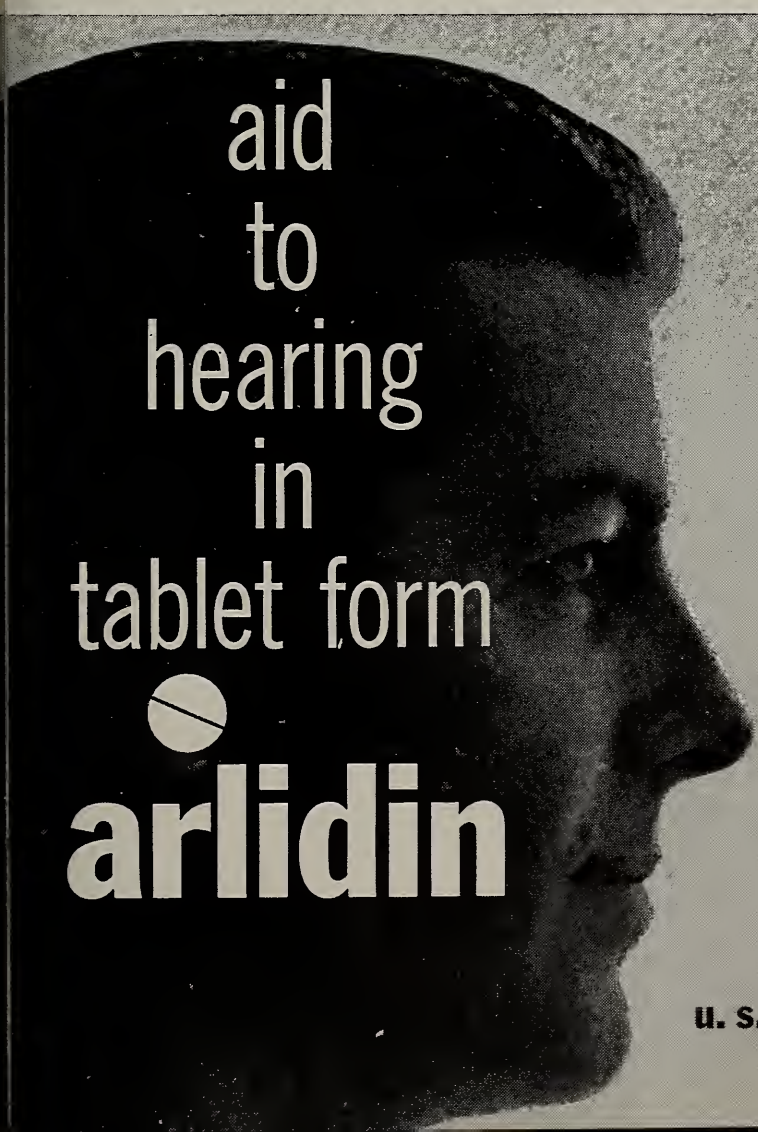
An emeritus member of the Section of Orthopedic Surgery of the Mayo Clinic, **Dr. Henry W. Meyerding,** attended the World Congress of the International Society for the Welfare of Cripples. After that meeting, Doctor Meyerding served as honorary chairman of the Eighth Congress of the International Society of Orthopedic Surgery and Traumatology. Doctor Meyerding was one of the founders of this society in Paris, France, in 1929, and was president of the Sixth Congress of the group, held in Amsterdam, Holland, in 1948.

* * *

Among the fifteen new members of the Board of Directors of the Sister Elizabeth Kenny Institute are **Dr. Frank H. Krusen,** Rochester, president; **Dr. Miland E. Knapp,** Excelsior; **Dr. Frederic J. Kottke,** Minneapolis; **Dr. E. G. Huenekens,** Minneapolis; **Dr. Paul M. Ellwood, Jr.,** Minneapolis; and **Dr. Owen F. Robbins,** Minneapolis. Mr. Thomas P. Cook, Executive Secretary of the Hennepin County Medical Society, is also a member.

* * *

Dr. Lawrence M. Randall, Mayo Clinic, specialist in obstetrics and gynecology, retired from active practice in the first part of October. Doctor Randall is a graduate of the State University of Iowa and served his internship in the State University of Iowa Hospitals. He served a residency of two years in these same hospitals.



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1. Rubin, W., and Anderson, J. R.: Angiology 9:256, 1958.

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SPACE MEDICINE

And Astronaut Selection

A. H. SCHWICHTENBERG, M.D.
Albuquerque, New Mexico

THE SUBJECT of space medicine is quite new to the agenda of medical meetings since it has only quite recently become a matter of general interest and vital public concern.

Physicians with their extensive scientific training and background have an excellent appreciation of the enormous scientific and technological progress prerequisite not only to the achievements in space exploration so far, but also those involved in the remarkable weapons systems developments which protect our nation. At the same time it is remarkable to note that physicians have been so slow in adopting many of these advances such as data processing and handling; mathematics and computers; physics and chemistry; engineering and technology and others to medical research and to the everyday practice of medicine. These advances might well have a revolutionary impact.

Dr. Schwichtenberg is Head of the Department of Aerospace Medicine, Lovelace Foundation for Medical Education and Research, Albuquerque, New Mexico.

Much of this slowness is believed due to inadequate communications between scientists, engineers, and physicians. Imaginative physicians with initiative and multidisciplinary backgrounds who can communicate in their own terms with leaders in these rapidly expanding new fields are badly needed. Many of these outstanding individuals are eager to assist the medical profession.

Clinical medicine consists generally of delineating the stresses placed upon the human organism by various disease processes, injuries, toxic conditions, abnormal metabolic processes, psychosomatic, and psychiatric processes. The accuracy of diagnosis and of providing or developing, insofar as possible, appropriate corrective therapy is of primary importance.

Actually, some types of treatment such as surgery, impose serious additional stresses upon the body. Much splendid research effort has gone into extending the frontiers of knowledge in all of these fields and these naturally are the usual subject for discussion at medical meetings.

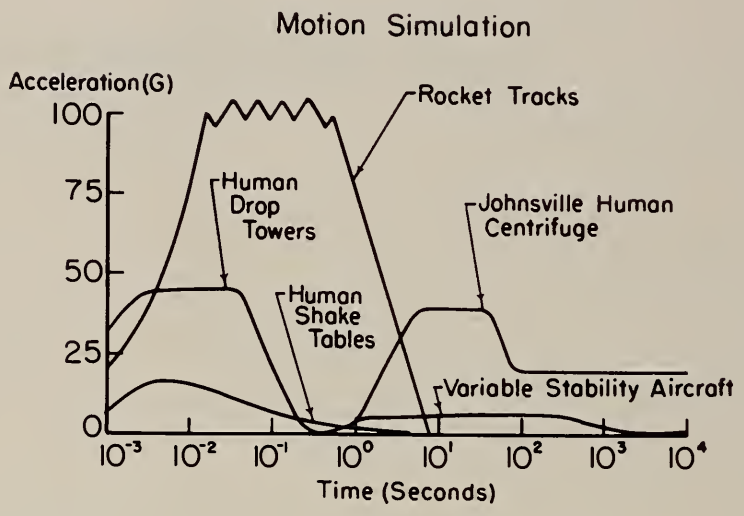
By contrast, Aviation and more recently, Space Medicine, goes to great lengths to select individuals

essentially free from these kinds of internal stresses familiar to the practicing physician. The stresses that specialists in Aerospace Medicine are concerned with are those imposed upon the human organism by the circumstances connected with flight in the atmosphere around our planet and in the space beyond.

Among the more important of the human stresses that are involved in space flight are acceleration, heat, vibration, radiation, decompression, weightlessness, noise and illumination. In addition there are a number of stressful factors which are more directly concerned with the operation of the space craft itself such as the provision of a proper atmosphere, day-night and rest-work cycles, diet, hygiene, fatigue and psychological factors. These must be studied in order to determine human tolerances and limitations. What has been learned from these studies is of critical importance to design engineers who must develop space vehicles which meet human requirements for an environment in which man can effectively carry out his functions in reasonable safety and comfort.

In addition, the complex tasks confronting an Astronaut in a space vehicle requires a very careful study of how man's talents and capabilities can most effectively be utilized. It is essential to effectively coordinate and integrate man's efforts with the functions and capabilities of the remarkable automatic and semiautomatic sensing and control devices often called "black boxes" which surround him. Many so-called "Human Engineering" studies have been conducted to obtain additional knowledge in this important field. Finally all space craft and component designs and the results of all studies must be verified by checks in the actual environment of space in order to insure efficient functioning and reliable long-term operation.

Detailed references have not been given throughout the paper as is customary since the number would have become unwieldy. The bibliography lists a few carefully selected general references to Aerospace Medicine, each of which contains extensive references that can serve as points of departure for further exploration of subjects of special interest.



U. S. Naval Aviation Medical Acceleration Laboratory
Johnsville, Pennsylvania
from Carl C. Clark, Ph.D.

Fig. 1. Motion Simulator—Devices for Producing Acceleration

I. Acceleration

In projecting manned space vehicles into space environment either in relatively short ballistic flights lasting only a few minutes or for a few ninety-minute orbits around the earth as contemplated in the Mercury project, acceleration is probably the most important of several physical stresses

imposed on man. During the last war, extremely important information was accumulated on the effects of acceleration on man by the use of several human centrifuges at the Mayo Foundation, at Wright Field, the Naval Aeromedical Laboratory, the high-speed sled tests using the tracks at Holloman Air Force Base, and others. Additional information is being collected on the largest human centrifuge in the free world at the Naval Acceleration Laboratory at Johnsville, Pennsylvania. Devices for producing acceleration of various intensities and time durations are shown in Figure 1.

Acceleration is measured in terms of g which is the normal gravitational force acting upon our body and is equal to our mass or weight. If a force equivalent to 2 g should act upon an individual, he would, in respect to the direction of the force, weigh twice as much. The most important measurements in acceleration are the rate of onset in g's per second, the direction of the g forces with respect to the long axis of the body and the time at peak g. Additional factors may also be of prime importance in relation to human tolerance limits to acceleration, such as the combined effects of the other stresses which may be imposed at the same time.

The normal young adult male can tolerate about 5 g for five seconds before blacking out owing to pooling of blood in dependent portions of the body. Three g's may be tolerated for about one hour and Doctor Clark of Johnsville Acceleration Laboratory tolerated 2 g for twenty-four hours. Under this acceleration he noted headaches, anesthesia of a finger, increased water retention, increased white blood count and reduced motivation. Head motions must be kept minimal however, because of the coriolis effect on the semicircular canals which causes disorientation and nausea. Had Clark been in a space vehicle accelerated at this level for twenty-four hours, he would have attained a calculated velocity of 3.8 million miles per hour and would have traveled 45 million miles. Selected music provided an important distraction from generalized discomfort.

Individuals who have been subject for acceleration studies have described the direction of g forces by using the direction in which the eyeballs tend to be displaced. "Eyeballs down" means upward acceleration with relation to the long body axis and is the same as positive acceleration. "Eyeballs up" is the reverse. "Eyeballs in" is forward transverse acceleration and "eyeballs out" is backward transverse acceleration. "Eyeballs right" or "left" would similarly refer to transverse lateral acceleration.

The study of g forces of short duration with rapid onset and high peak values acting in various directions cannot be accomplished on the human centrifuge because of power and structural limitations. For such studies, Colonel John P. Stapp, and associates, at the United States Air Force Acceleration Laboratory at Holloman Air Force Base, has used the high-speed rocket propelled sled,

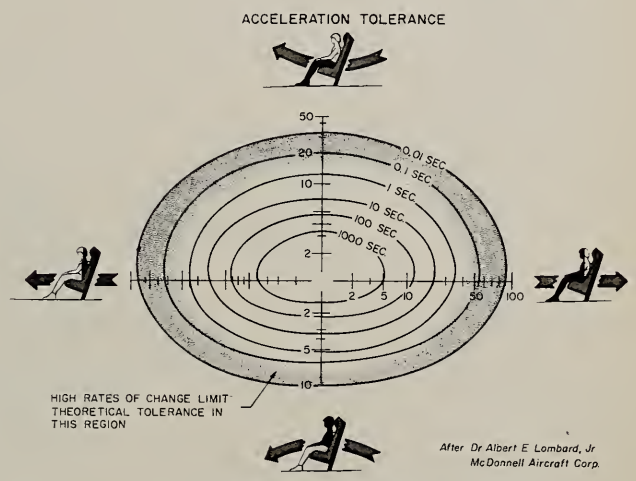


Fig. 2. Acceleration Tolerance

together with an ingenious system of water brakes for the work on tolerance to impact or high g forces, applied with very rapid onset and with very short time durations. Figure 3 shows the limits of human tolerances to such impact type of accelerative forces.

The engineers must design space vehicles so that the man will not be subjected to forces either too closely approaching tolerance limits (Fig. 2) on rocket boost into orbit and re-entry into the atmosphere or those similarly approaching tolerance limits (Fig. 3) on impact with the earth's surface on landing. This is important because of the unknown extent of the adverse effect of other combined stresses on these tolerances. The effect of extended periods of weightlessness on subsequent g tolerance is unknown.

These data have wide application in preventive medicine because they provide physicians and engineers with precise information that can be used

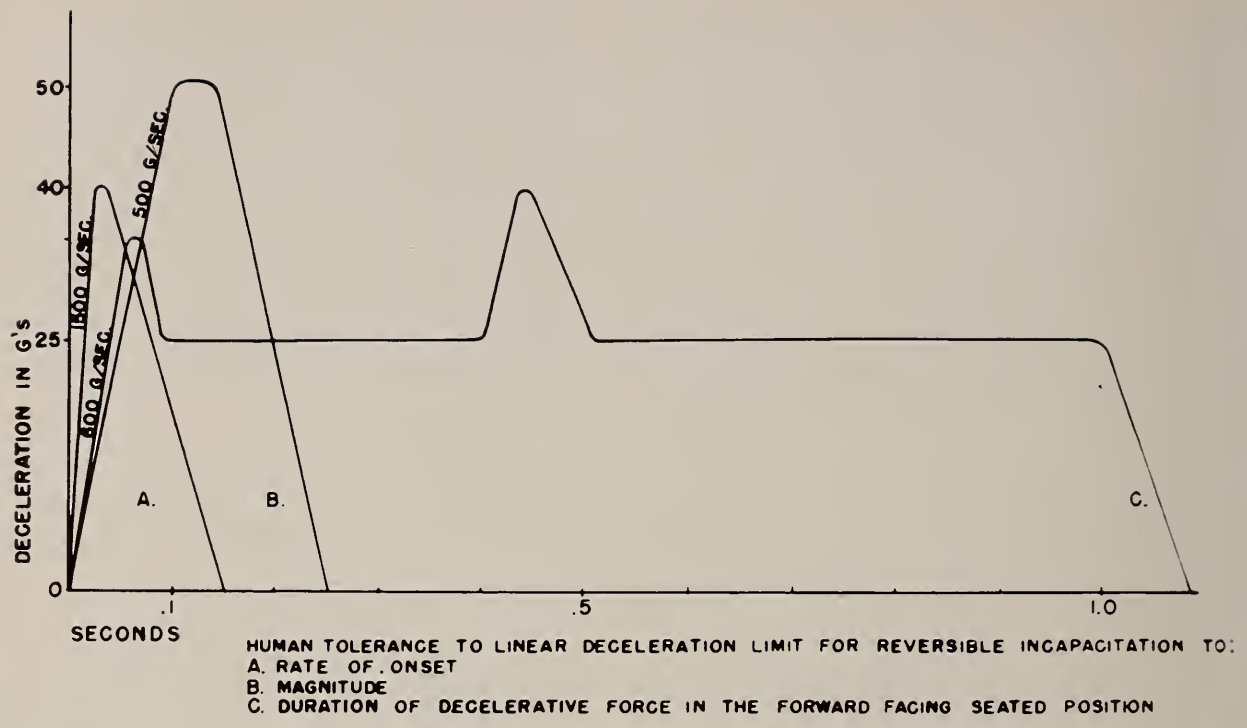


Fig. 3. Tolerance to Deceleration

in automotive and seat belt design. The effective application of this knowledge can save hundreds of lives and prevent many serious injuries now sustained daily by individuals involved in automobile accidents.

II. Heat

So far, the measured heat levels maintained within orbiting vehicles appears to be within tolerable levels. Heating of space vehicles due to aerodynamic heating from air friction has not proved a very serious problem during the boost phase because speeds do not reach high values until the vehicle is largely beyond the earth's atmospheric envelope. The only way heat can be dissipated in space is, of course, by radiation. That side of the capsule facing the sun will become very hot while that facing away will become very cold. Unless equalized by some method or provided for by construction this will set up stresses due to expansion and contraction of the capsule structure which in turn may increase the leak rate of the air within. The problem can be resolved by either slowly rotating the capsule to heat and cool all surfaces evenly, or by a heat exchange mechanism between the hot and cold sides and also by the use of reflective paints or a combination of these. Rotation of space craft to equalize heating and provide some artificial gravity may well have an undesirable side effect in orientation with head movements.

On re-entry to the earth's atmospheric envelope, heating due to air friction or aerodynamic heating becomes an extremely serious problem. This causes most meteors to flash into incandescence and vaporize. The development of successful ways to avoid this for missiles and manned space craft traveling at orbital or near orbital velocities of almost 18,000 miles per hour or escape velocities of over 25,000 miles per hour is difficult. In the Mercury capsule this has been accomplished by the use of an ablation type of heat shield over the base of the capsule.

Precooling of the capsule prior to re-entry to the earth's atmosphere will be accomplished. This stress has been shown to be within human time-temperature tolerances by experiments with volunteers in space suits in heat chambers simulating the calculated times and temperatures of the capsule in its re-entry. These time-temperature calculations have been verified by actual test flights of

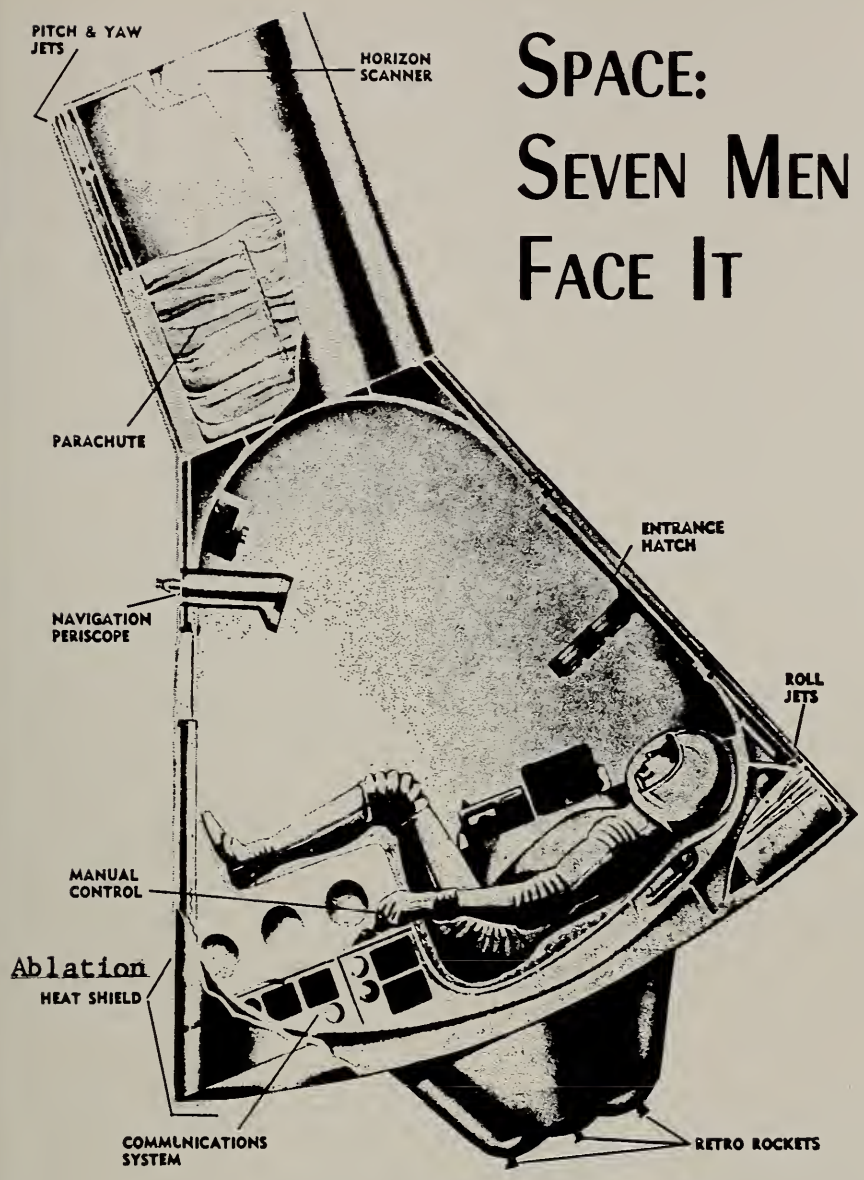


Fig. 4. Mercury Space Capsule

the unmanned and monkey-containing Mercury capsule. Shown in Figure 5 are heat-time tolerances for humans in light, one-piece clothing.

Instead of the ablation shield used in the Mercury capsule, another method of keeping a capsule from burning up is the use of a heat sink composed of materials like beryllium which absorb large amounts of heat. This must be separated from the base of the capsule after re-entry. There is still an additional important method of dissipating the heat of re-entry into the atmosphere. This involves the use of newly developed materials with extremely high heat resistance coupled with the use of stubby winged glider type vehicles (Dyna-Soar), which can skip in and out of the outer atmosphere on its re-entry. This permits alternate heating and cooling by radiation while gradually slowing down for final re-entry into the earth's atmosphere. The wings will also permit some soaring capability when within the atmosphere thus providing choice of landing sites over a radius of many hundreds of miles.

III. Vibration

Vibration has been a matter of concern as a human stress only recently. Most of the work has been done in military aero medical laboratories or under their auspices in other laboratories. It is encountered especially during boost and re-entry phases of rocket flight when it is superimposed on

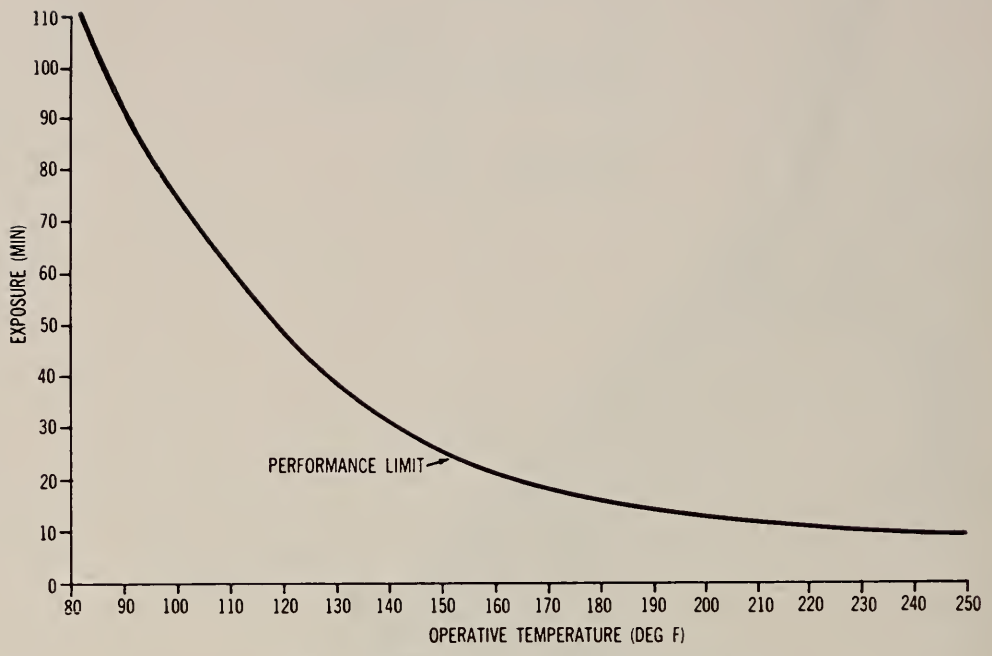


Fig. 5. Heat-Time Tolerances for Humans

For studies of human performance under heat loading, tolerance time is related to operative temperature. (E. T. Carter, *Space/Aeronautics,* July, 1959)

the accelerative forces. Recently studies have been made using the shake-table as a laboratory instrument. Here the subject is firmly fastened to a seat on a table which moves in a sinusoidal manner with an excursion of about one-half inch at various cycles per second (cps). These studies are still in the early stages but indicate that organs and organ systems of the body seem to have natural frequencies so that marked harmonic to- and fro movements are set up as a result of certain vibrational frequencies. These movements place tension upon ligamentous attachments and if continued, depending on the frequency, produce cardiac pain, nausea, and vomiting, also hematuria and bloody stools have been reported. Figure 6 indicates frequencies and related symptoms. The range from 2 or 3 to 30 cycles per second appears to be the most important physiologically though there is another region around 40 cps which also has adverse effects as well. In spaceship design, as well as in industry, structures and operations having these vibrational frequencies should be avoided or the occupant or worker should be shielded from their effect by suitable vibration absorbing or dampening devices.

IV. Meteorites

The environment of space provides a very hard vacuum of 10^{-14} mm. Hg as compared to about 10^{-10} mm. Hg as the best that can be obtained in earth laboratories. In this vacuum one finds meteors and radiation of all kinds traveling in all directions. One advantage of low altitude orbits is that the space vehicle is shielded from almost one-half of these factors by the earth.

Meteors and meteorites are potentially dangerous to space vehicles in proportion to their relative speed, mass and, as a consequence, the energy released on impact with the skin of the space vehicle. The damage ranges from gradual etching of unprotected optical surfaces and the polished

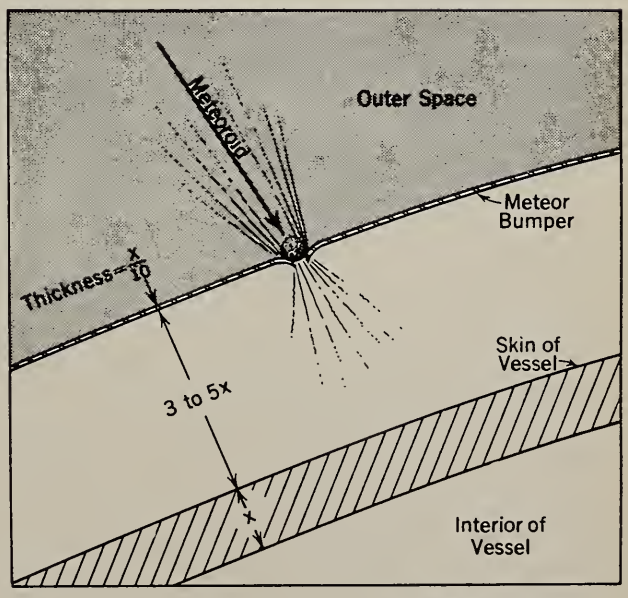
CRITERIA OF TOLERANCE TO VIBRATION

CYCLES PER SECOND	SYMPTOMS						
	Abdominal Pain	Chest Pain	Testicular Pain	Head Symptoms	Dyspnea	Anxiety	General Discomfort
1					XXXXX XXX		XXX
2					XXXXX XXX		XXXX
3	XX	XX			XXXXX	X	XXXXX
4	XX	XX		XX	XXX	XX	XXXXX
5		XXXX				X	XXXXX X
6	XXX	XXXX		X			XXXX
7	XX	XXXXX	X	X			X
8	X	XXXX		X		XX	XXX
9	XX	XXXX			X		XXXXX
10	X	X	XXX	XX		X	
15							XXXXX XXX

WADC Tech Rpt. 59-391 From Zeigenruecker

Fig. 6. Criteria of Tolerance to Vibration

skin of the vehicle from dust particles to small craters from slightly larger masses, to small punctures and finally catastrophic explosions if collisions with sizable meteors occur. Whipple developed the concept of a meteor bumper. It will vaporize most of the smaller meteorites on impact so that hull penetration probability is reduced. The calculated probability of hits on a space craft by a meteorite capable of causing a puncture has been variously estimated from once in a month or so to once per year. On one occasion seventeen impacts were recorded by telemetered sound pickups on a 50 cm. spherical space probe in ten minutes. However, no knowledge is available to determine any damage resulting from these impacts. Much more information from space as well as from the laboratory is required in this area to properly assess the risks and probability of damage as well as how to best provide protection.



From Whipple

Fig. 7. Meteor Bumper by Whipple

V. Hypoxia and Decompression

If the space vehicle is punctured by a meteorite, leaks will occur and if not repaired immediately the passengers will be subject to hypoxia and decompression or aeroembolism. There is limited time available as illustrated by Figure 8, showing time of useful consciousness at various atmospheric pressures. For space vehicles the actual time available will depend upon the rate of pressure loss. The time during which pressure is lost is mathematically determined by the size of the hole, the volume, and air pressure of the space vehicle and the volume of stored gas which can be released per minute in an emergency. The symptoms and dangers of various levels of hypoxia are well-known to physicians and will not be elaborated upon in this paper.

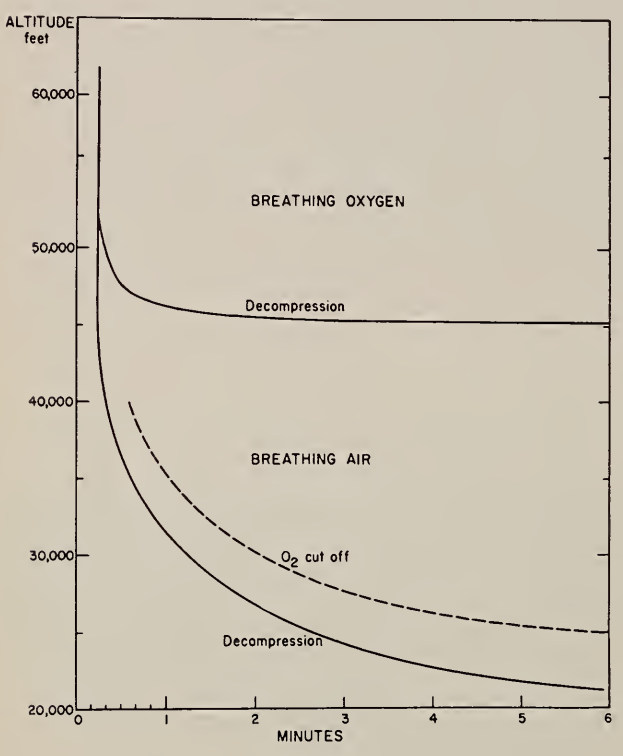


Fig. 8. Time of Useful Consciousness

Solid curves: time of useful consciousness at altitude after rapid decompression breathing air (below) and breathing oxygen (above) in pressure cabin. Interrupted curve: time of useful consciousness after separation from oxygen supply in unpressurized cabin.

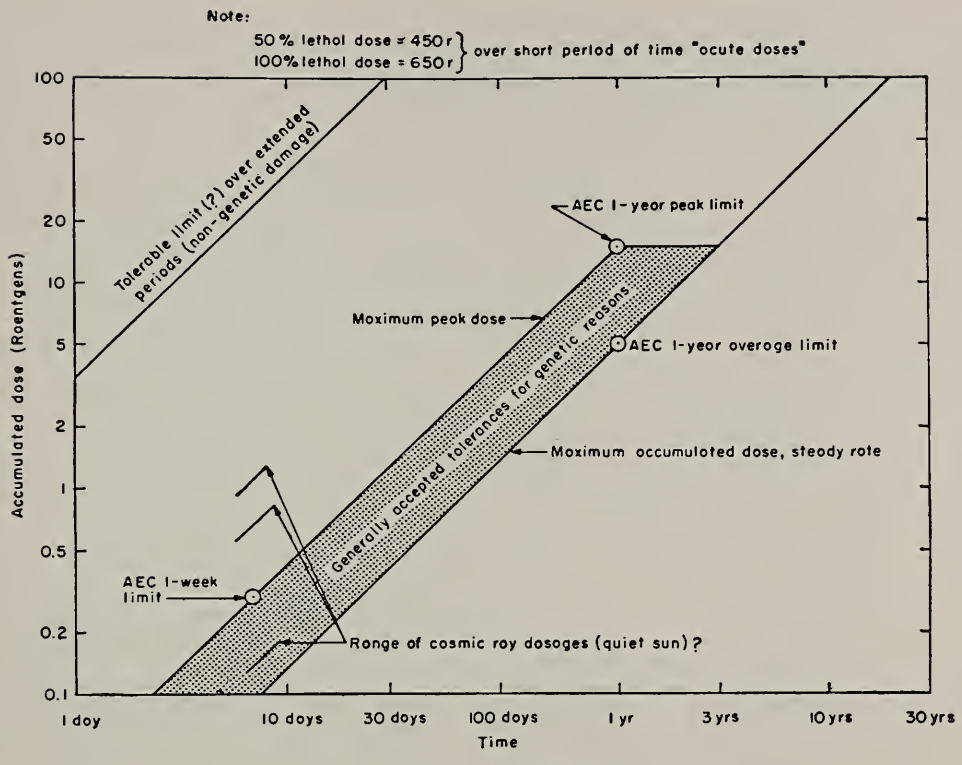
Somewhat less well-known is another effect of diminished atmospheric pressure related to decompression sickness as seen in divers, caisson workers and more recently in skin divers who remain at considerable depth and pressures for some time then return to the surface too rapidly. Under these conditions, bubbles of carbon dioxide and nitrogen come out of solution in the tissues because the pressure is diminished more rapidly than the excess nitrogen in solution can be eliminated through the lungs. Armstrong proved that just as it was known to be unsafe to reduce underwater pressures by more than one-half at a time with a suitable period for adjustment, so also was it unsafe and symptoms were produced when the atmospheric pressure was reduced by more than one-half as in high altitude aircraft flights without adequate cabin pressurization. He called this aeroembolism.

In either case the symptoms are similar be they in divers, pilots, or occupants of disabled space vehicles and aircraft and depend upon where in the body tissue the bubbles form. Symptoms may be primarily neurological, respiratory, joint pains or skin sensory disturbances and they are often combined. They may be mild and transient, or increasingly severe and occasionally produce permanent disability or death. Since nitrogen is about five times as soluble in oils and fats, individuals who are stout are usually more rapidly and seriously involved than lean individuals. The symptoms can be prevented or delayed by prebreathing 100 per cent oxygen for about two hours during which time most of the nitrogen is removed from the body. This has long been used as a protective measure by military pilots who fly at extreme altitudes.

Until recently, with the advent of commercial jet transports which operate most economically between 30,000 and 40,000 feet, the possibility of exposing other than military pilots and crewmen to decompression did not exist. Improvements in aircraft design and pressurization system reliability following earlier decompression accidents has all but eliminated this possibility in civilian air liners. Until the extent of this problem has been determined by actual experience, occupants of space capsules during the early space flights will wear a full pressure type suit which is automatically inflated, should this become necessary. This will permit the occupant to survive even the vacuum of space for some time.

VI. Radiation

In addition to meteoritic material which has obvious dangers to space vehicles there is a wide



Human tolerances to radiation

Select Congressional Committee, Staff Report
Astronautics and Space Exploration, 85th Congress, 1959
Mr. McCormack, Chairman
Government Printing Office

Fig. 9. Human Tolerances to Radiation

range of radiation, both particulate as well as in the electromagnetic spectrum. Included in these are the cosmic ray particles consisting of protons and heavier atomic nuclei up to and including iron, stripped of their electrons, traveling at near the speed of light and in all directions. They originate in galactic space and from the sun, especially during solar flares. The hull of the space vehicle protects man from some, but by no means all, of this radiation. Most radiation in nearby space comes from the sun and it is now believed that the earth is in the fringe of the solar carona.

There is much more information needed on the particulate and electromagnetic radiation spectrum in space, and additional facts are learned from each satellite and space probe. At present the spectrum of radiation in space is believed to consist of electrons with energy levels ranging up to more than 1 million electron volts (MEV). There are protons with energies ranging up to 500 MEV or even higher perhaps into the billions of electron volts and the heavy nuclei of primary cosmic radiation have energies upwards of 500 MEV as well as beta and x-rays of 0.5 to 5 MEV of bremsstrahlung and nuclear origin. These originate in the hull of the space craft when molecules are struck by high energy particulate radiation and destroyed with the liberation of x-ray and the formation of new materials. Neutrons are also present. The proton radiations, particularly in the inner Van Allen hard radiation belt with energies of about 500 MEV or higher, are similar to those produced by a cyclotron on earth. It requires about 1 cm of lead per MEV to shield against them. Thus 400 MEV protons require about 4 cm. of lead for reasonable shielding. Such a minimum shell of lead 4 meters in diameter will weigh about 5 tons. Much larger booster rockets will be necessary before such additional loads can be projected into orbit. The softer radiation more characteristic of the outer Van Allen belt can be largely shielded by 1 or 2 mm. of lead though re-radiation from the

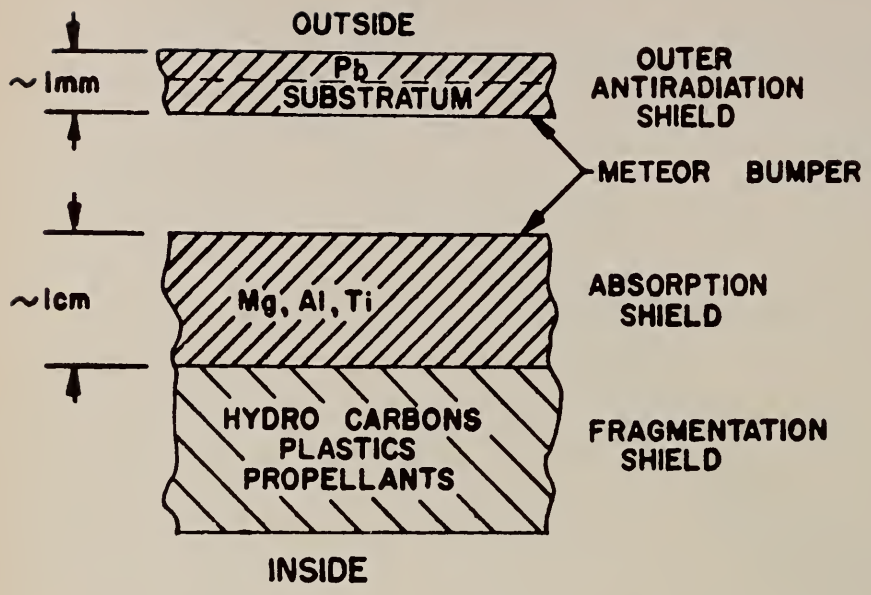


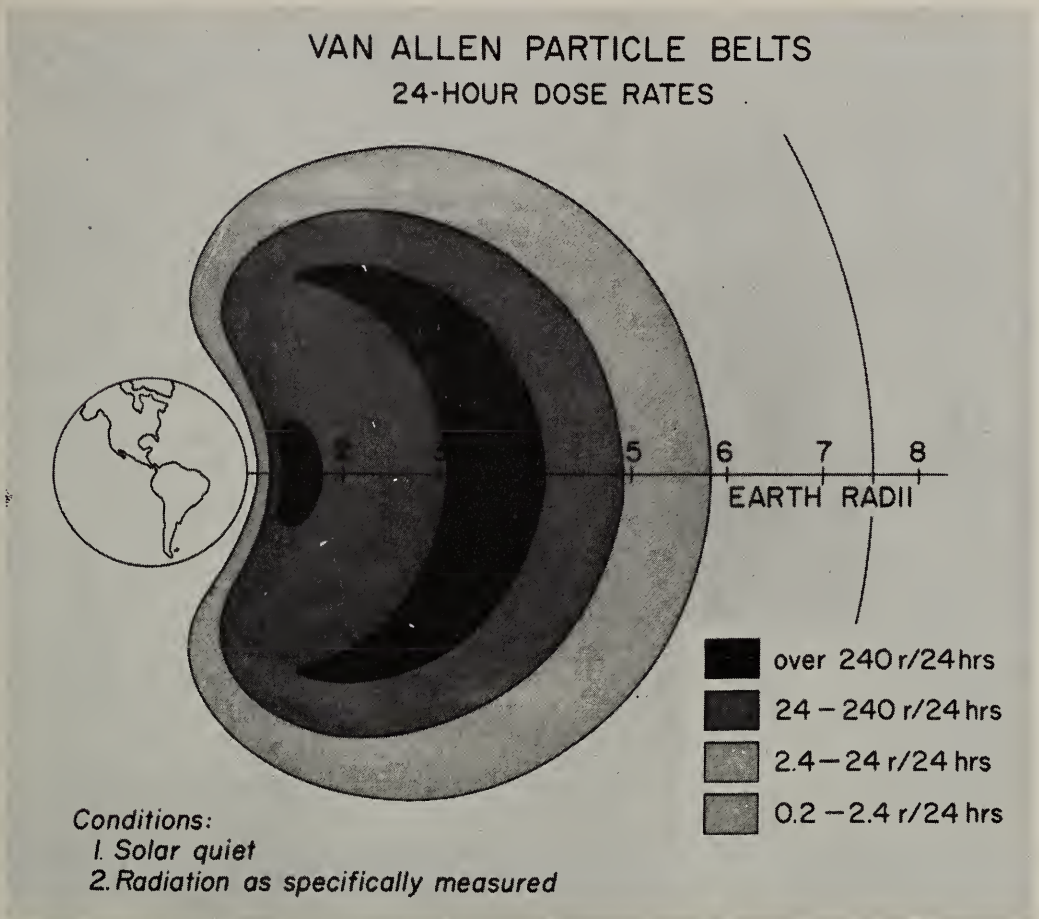
Fig. 10. Radiation Shield Design.

An optimum radiation-shield design based on the presence of a large flux of low energy protons. The outermost layer of lead reduces the radiative processes in these protons by introducing a high Coulomb barrier. This outer skin can be spaced from the inner structural skin using the meteor bumper design suggested by Whipple. The skin of the vehicle itself is made of low atomic number material to reduce the radiation from electrons; also low atomic number materials have a higher stopping power per gram per centimeter than, e.g., lead. The inner layer of hydrogenous material (fuel, propellants, plastic, water, etc.) serves to fragment heavy primaries of the cosmic radiation and thus reduce their biological effectiveness.—S. Fred Singer, Department of Physics, University of Maryland.

hull may present some problems. An optimized radiation shield including the meteor bumper concept is shown as Figure 10.

The medical implications of this level of radiation are obvious to physicians. However, exact determinations of relative biologic effectiveness (RBE) of radiation in space are limited by insufficient detailed knowledge of the spectrum and the inability to reproduce all types of radiation in earth laboratories. In the equatorial plane at about 2000 miles altitude in the inner Van Allen belt the exposure to man, if unshielded, is thought to be on the order of 5 to 10 or more r per hour which would approximate the maximum allowable yearly exposure as now estimated. Until much more powerful rocket boosters are developed to project capsules with shielding into space or possibly until some new approach to shielding is developed, earlier manned space flights must be kept below 400 miles or over about 30,000 miles altitude, well below the inner and outside the outer Van Allen belts, respectively.

Even when space exploration is established, these high-radiation areas will probably be avoided or rapid transit times arranged to reduce total exposure. Nor can one be certain of keeping within allowable limits even in the lower radiation level zones mentioned above because major solar flares may temporarily increase radiation to dangerous levels even in these areas. Without better shielding even in the space outside the Van Allen belts it now appears that radiation exposure may be the limiting factor on the length of trips.



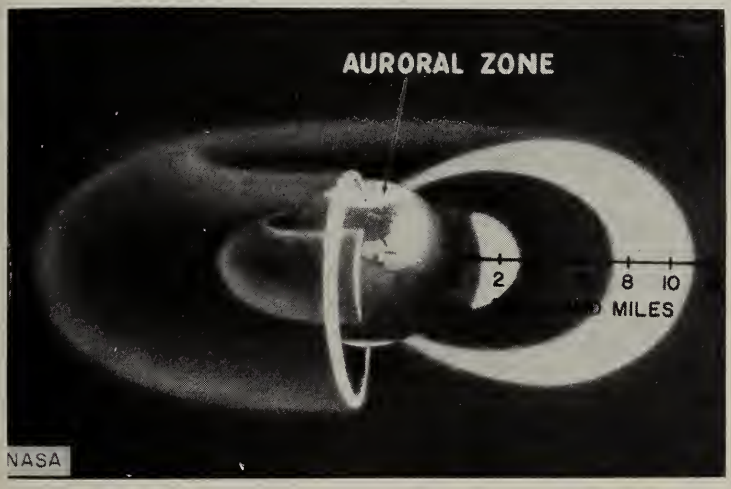


Fig. 11. Van Allen Particle Belts

VII. Weightlessness

No subject has more speculation and less knowledge than the phenomenon of weightlessness. Experiments in aircraft flown in Kepleran trajectories can approximate weightlessness for theoretical maximums of about seventy-five to ninety seconds. Durations of fifteen to about forty-five seconds are more common. Early manned ballistic flights with the Mercury capsule will produce several minutes of weightlessness, but it will not be until orbital flight is achieved that any real information will be available covering several hours' exposure. Based upon the limited experiences gained from animal and monkey shots, it is believed that this will not prove too serious for individuals such as test pilots who have become accustomed to flight and who are trained in weightlessness insofar as this can be done in aircraft. The extent and times to which humans can adapt to extended weightlessness is not yet known.

VIII. Noise

Sound waves of course are not propagated in the vacuum of space though the noise of equipment within the capsule and meteroite hits on the hull will be heard by the man within the atmosphere of the capsule. The medical implications of the noise levels within the capsule are the same as on earth. Noise will doubtless reach very high levels in excess of 120 db., during the boost and re-entry phase of space flight and may adversely affect total tolerance to accelerative stresses when added to the other stresses at these critical periods. Communications may be temporarily impaired for this and other reasons during boost and especially during re-entry.

IX. Illumination

Because of lack of material in the vacuum of space to provide reflectance, the background is very dark and the light is more intensely bright. Thus the instruments may require intense illumination. This becomes marked above approximately 100 km. or 60 miles from the earth where brightness contrasts as high as 1 to 60,000 have been estimated by Campbell. This glare in sunlight and darkness in the shade may well produce eye-strain by continuous efforts of accommodation. Protective lenses will be required when viewing very bright objects in space if retinal damage and disturbances to light adaptation are to be avoided. Again future experience alone can tell how severe this problem will be.

X. Cabin Environment and Atmospheres

It is clear that man cannot function satisfactorily for long periods when enclosed in a full pressure or space suit. While essential for the shorter early flights until the various hazards in space have been encountered and accurately evaluated, a "shirt sleeve" environment should be provided for longer periods. While conjectural at this time it is anticipated that for flights of a month or so, artificial gravity need not be provided. Routine exercises with simple equipment will be required to insure physical conditioning. It has been determined that rotation of a space ship to produce artificial gravity may produce disagreeable side-effects because of the disorientation caused by head movements.

It is expected that a level of compromise in cabin atmosphere will be used to provide 5 to 10 psi pressure with proper oxygen partial pressure to provide near sea-level pulmonary oxygen partial pressure levels. Pure oxygen must thus be furnished if 5 psi is used and inert gas-oxygen mixtures used for the higher pressures. While a simple pressure control is adequate for low-pressure pure oxygen systems, increasingly complex analysis and control systems are required for gas mixtures. For missions of up to about a month's duration, stored supplies of liquid oxygen or the use of super oxides may well prove economical weightwise. Carbon dioxide can be absorbed with lithium hydroxide, odors removed by charcoal filters and various methods can be used for toxic gas removal. Temperature and humidity will be controlled by refrigeration systems. Supercooling to freeze out carbon dioxide and toxic materials as well as remove excess moisture is a possibility. Much has been learned of toxicological problems from naval nuclear submarine experience where prolonged exposure to a given atmosphere has shown that small amounts of substances not previously considered toxic, as used in industry, became so when breathed continuously. For longer flight periods a photosynthetic gas exchanger is desirable using special algeal cultures or hydroponics farms to remove carbon dioxide, liberate oxygen and provide food sources. This still requires a large and costly research and development effort and any system developed must be extremely well tested under space conditions to prove out designs, essential stability of cultures, and long-term reliability under the conditions of space. Liquid oxygen and certain metallic superoxides and electro chemical regenerative systems are possible sources of oxygen.

Algae as food do not provide all the essential amino acids so that additional protein sources must be provided, such as perhaps fish or molluses growing in an algeal solution, as well as perhaps a separate small hydroponics farm supporting chickens, and providing additional food variety. Human and other waste materials must either be dried and stored or incinerated in shorter flights or re-used in the regenerative or closed ecological algae systems for longer periods. Care must be exercised to avoid placing debris in the orbital regions because of subsequent collision hazard. Periodically a very light-weight disposable capsule may be retro-fired in such a way that the capsule

together with all unwanted materials will be incinerated on re-entering the atmosphere.

XI. The Selection of Astronauts

Knowledge and experience gained from Aviation Medicine was the basis for the criteria in the selection of Astronauts. The Special Life Sciences Advisory Committee of the National Aeronautics and Space Administration, representatives of the United States Air Force and Naval Schools of Aviation Medicine, Aeromedical Laboratories, National Science Foundation and civilian specialists joined in developing the selection procedures and medical criteria for Astronauts. It was considered desirable for the first group to consist of specially trained experimental test pilots who met stringent physical and other requirements. They were to be less than forty years of age and weigh less than 180 pounds, with at least 1500 hours of pilot experience, much of which was to have been in modern high-performance jet aircraft and also possess an academic degree in engineering or the basic sciences. They were to be volunteers, very highly motivated, eager and capable of extending their knowledge and training. This was extremely important in light of the NASA concept that in addition to becoming an Astronaut, each one was to be trained to become a specialist in some phase of astronautics, such as propulsion, communications, life support systems, design and construction, navigation, etc. Thus, additional previous training and demonstrated interest and aptitude in these fields were important factors as well as the individual physical and other qualifications in final selection. Later on, volunteer scientists and physicians with special aptitudes, meeting the physical and other qualifications will doubtless be selected for space crews based upon what is learned from the early space flights and the particular mission of future space vehicles. It is believed certain, that in time highly qualified women will also be included in space crews.

There were several phases to the Astronaut selection process, not all of which were connected with medicine. First, records of suitable individuals meeting the criteria noted above were screened, personal interviews arranged to determine interest, and written examinations taken to indicate breadth of readily available knowledge. The physical examinations, physiologic and stress tests preceded a final selection by NASA officials at which time all factors were weighed and the first seven Astronauts selected.

The medical evaluation and selection procedure of special interest to physicians, made use of engineering concepts to some extent as well as long-established aeromedical and clinical medical procedures. In this sense, a most careful medical, family and special aviation history, physical examination, laboratory and x-ray tests were done and were considered generally in the nature of a static test of the body essentially at rest.

An unusually complete physical examination was performed on all candidates including special tests in ophthalmology, otorhinolaryngology, audiology and voice recording, nerve and neuromuscular conduction studies, electroencephalogram, Master's double two-step, tilt table and complete radiological studies using low-exposure techniques as well as a most complete laboratory work-up. A list of tests in addition to routine clinical tests is shown as Figure 12. Part of the laboratory work was to obtain base-line information for future reference.

Certain physiological tests of physical competence were added which provided specific information on the maximum physical effort the body was able to exert safely. Here a bicycle ergometer was used. This was considered a dynamic test in engineering and scores achieved were compared to those of normals by age group in terms of oxygen uptake per kilogram of total body weight and per kilogram of lean body mass per minute at maximum effort, oxygen pulse (the number of cc. of oxygen in the cardiac stroke volume at maximum effort), circulating blood volume and hemoglobin.

Total body water, using the tritium dilution method, total body radiation counts, made through the courtesy of the Los Alamos Scientific Laboratories, for total body potassium determinations and body specific gravities were useful in checking the lean-body mass determinations. These tests were done at the Lovelace Foundation and Clinic located in Albuquerque, New Mexico.

The stress tests, conducted at the U. S. Air Force Aero Medical Laboratory at Wright Patterson Air Force Base, carried the concept a step further in that here each individual was subjected to a uniform series of severe physiological stresses and the body responses carefully measured over an extended time period. These are considered roughly analagous to engineering fatigue tests. Blood

PHYSICAL EXAMINATION TESTS PERFORMED

IN ADDITION TO USUAL ROUTINE CHECKS

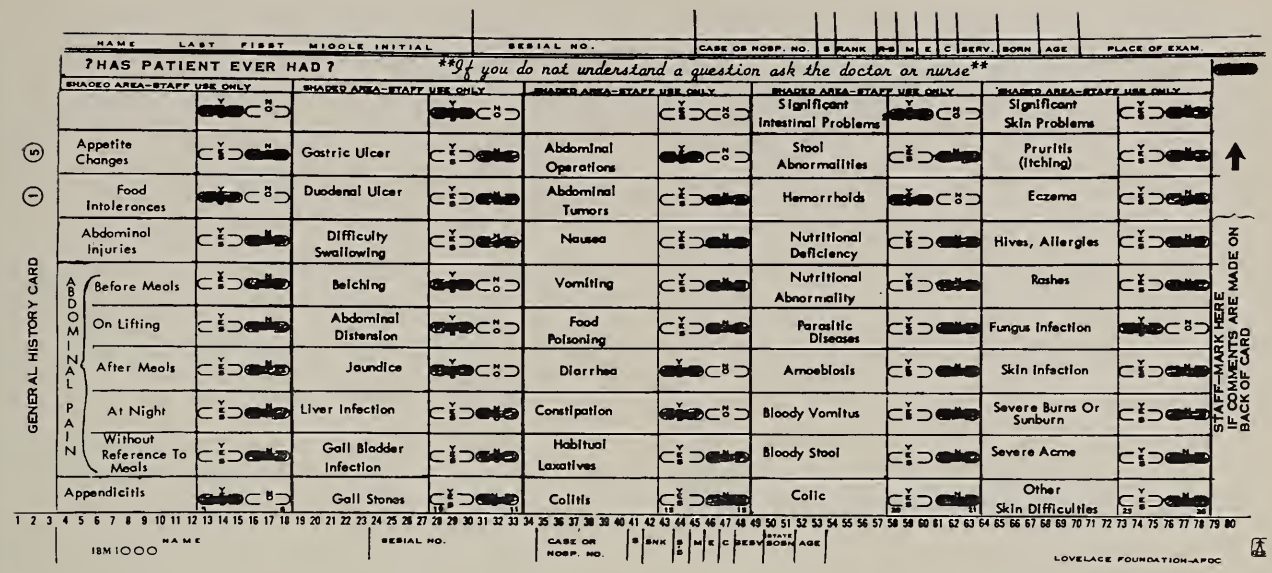
- Exercise response - blood pressure and pulse rate
- Complete Ophthalmological examination - refraction, slit lamp, dark adaptation, dynamic visual acuity, fundoscopic photography
- Complete ENT examination including caloric test for equilibration function
- Audiology with tape recording of special paragraph reading and perception in 80 db white background noise.
- Dental Examination
- Nerve conduction times and Neuromuscular conduction studies.
- Electroencephalographic study.
- Radiology - Chest, PA inspiration, PA expiration, right lateral colon, sinuses, lumbosacral spine, stomach and oesophagus. *Techniques to minimize ratiation.
- Laboratory - Blood grouping, hematocrit, special hematology smear, gastric analysis, cholesterol, protein electrophoresis, catacholomine, PBI, Serum, electrolyte studies, 24 hour urinary steroid excretion, plus routine blood, blood chemistry and urine test.

Fig. 12. Additional Physical Examination Tests, Astronaut Selection Program

pressure, pulse rate, respiration and electrocardiograms and other measurements as appropriate were made. It now appears as if performance tests while the subject is under stress, so devised that accurate grading is possible, will in the end prove the most meaningful in selecting individuals for space crews once it is determined that they have no medically significant defects. For economy and efficiency these tests may well be combined with training and final crew selection.

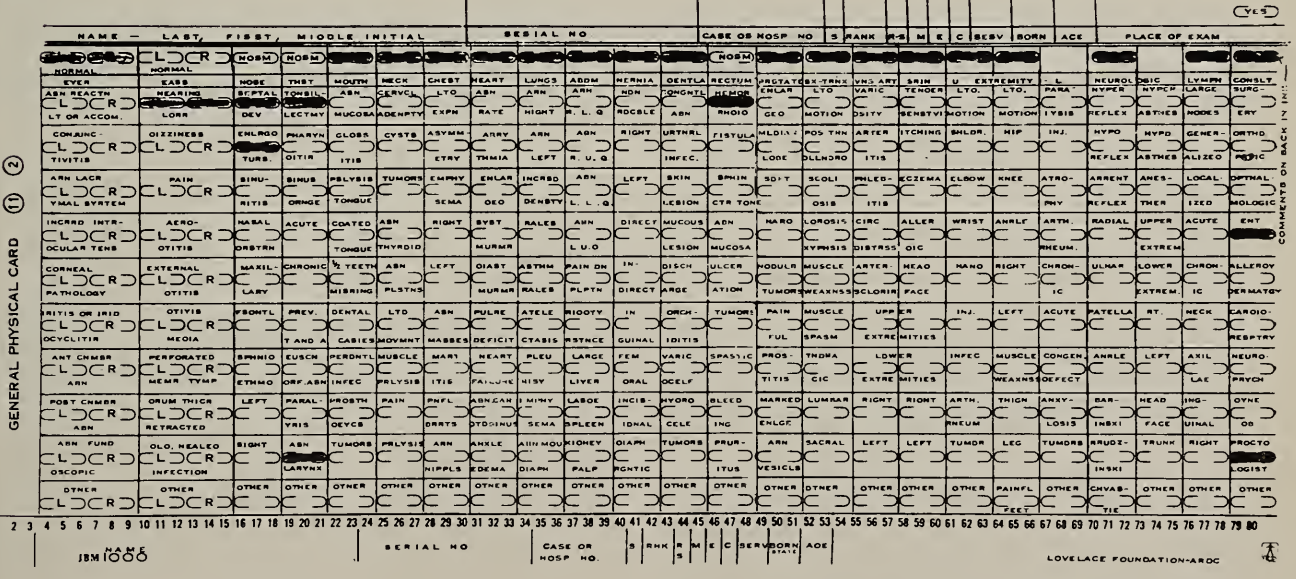
The stress tests done at the Aero Medical Laboratories were intended to be meaningful in terms of the stresses to be encountered and included heat tolerance testing for two hours, standard acceleration tolerance, test runs on a centrifuge, altitude tolerance in a partial pressure suit at 63,000 feet simulated in a low-pressure chamber for one hour, isolation tests for a brief period, modified cold pressor tests, vibration tests, performance tests in a high noise field, and additional physical competence tests. Also at the Aero Medical Laboratory, psychiatric and psychological evaluations were made as well as complete anthropological studies.

One of the noteworthy accomplishments in connection with the Astronaut examinations is that all information on all the tests done was recorded on specially designed medical machine record cards of the International Business Machine Corporation (IBM) type. This provided capability of applying modern data-processing and handling techniques in connection with one of the most searching examinations done on any group of individuals. Much correlation work remains to be done in this field.



MEDICAL HISTORY
(one of nine cards)

Fig. 13. History Card


NAME — LAST, FIRST, MIDDLE INITIAL
SERIAL NO
CASE OR HOSP NO
S RANK R-S M E C SERV BORN AGE
PLACE OF EXAM
GENERAL PHYSICAL CARD
NORMAL EYES
NORMAL EARS
NOSE
SEPTAL DEV
TONSILS-LECTMY
MOUTH MUCOSA
NECK CERVCL ADENPTY
CHEST LTO EXPN
HEART ABN RATE
LUNGS ABN RIGHT L. L. Q
ABDM ABN R. U. Q
HERNIA NON RDCBLE
GENTLA CONGNTL ABN
RECTUM HEMOR RHOID
PROSTATE ENLAR GEO
SEX-TRNX LTO MOTION
VNS ART VARIC OSITY
SKIN TENDER SENSTVTY
U. EXTREMITY LTO. MOTION
L. LTO. MOTION
PARA-LYSIS
NEUROL HYPER REFLEX
BIOC HYPCH ABSTNES
LYMPH LARGE NODES
CONSLT SURG-ERY
EAR INFECTION
HEARING LOSS
EYE ABN REACTN LT OR ACCOM.
DIZZINESS
PAIN
INCRSD INTR-OCULAR TENS
CORNEAL PATHOLOGY
IRITIS OR IRIDOCYCLITIS
ANT CHMBR ABN
POST CHMBR ABN
ABN FUND OSCOPIC
OTHER
OTITIS MEDIA
PERFORATED MEMB TYMP
RETRACTED
INFECTION
ENLRGD TURB.
PHARYN OITIS
SINU-SITIS
SINUS ORNGE
NASAL OBSTRN
MAXIL-LARY
FRONTL
PREV. T AND A
SPHNID ETHMD
EUSCH ORF ABN
LEFT
RIGHT
GLOSS ITIS
TONGUE
ACUTE TONGUE
CHRONIC
DENTAL CABIES
PERIODNTL INFEC
PARAL-YSIS
CYST
PELYSIS ORNGE
COATED
½ TEETH MISRING
PROSTH OEYCS
MUSCLE MOVMNT
PRLYSIS
ASYMM-ETRY
TUMORS
EMPHY SEMA
BYST MURMR
ABN THYROID
LTD
MASSES
MART ITIS
PNFL DRTS
ENLAR OEO
ENLAR DENSTY
RIGHT
ABN PLSTNS
LEFT
ASTHM RALES
ABN L. L. Q
ABN L. U. Q
PAIN ON PLPTN
PULRE DEFICIT
ATELE CTASIS
RIGOTY RSTNCE
ABN HEART
PLEU HISY
ABN CAN OTOPHNX
ABN SEMA
ABN SPLEEN
ABN MOU DIAPH
ANKLE EDEMA
ABN PALP
INCREAD L. L. Q
ABN L. L. Q
LEFT
DIABT MURMR
IN-DIRECT
DIRECT
IN GUINAL
LARGE LIVER
PLEU HISY
FEM ORAL
INCIS-IONAL
ABN GAN IMPH
ABN SEMA
KIDNEY DIAPH PLPTN
DISCH ARGE
MUCOUS LESION
SKIN LESION
LEFT
ORCH-IDITIS
VARIC OCELE
HYDRO CELE
BLEED ING
DIAPH RGNTIC
ULCER ATION
ABN MUCOSA
BPHIN CTR TONE
TUMORS
TUMORS
TUMORS

The IBM type cards can be filled in with minimum instruction, using a special electrographic pencil, by patients, laboratory technicians and physicians. They are automatically processed by machine which punches holes under each mark. One of the History Cards showing the use of the "yes," "no" approach is shown as Figure 13. Should explanatory notes be devised and needed on any card, they may be written in ink on the back of the card and the fact that notes are written on the back is indicated by the mark in the upper right-hand corner.

The physical examination card, shown as Figure 14, is considered a bit too crowded but has the advantage of having most of the general information on one card.

The method of recording numerical data is indicated on one of the laboratory cards and is easy to understand either by the physician or anyone else wishing to obtain information from them. Once these cards have been punched they may be used as inputs to computers and subjected to whatever mathematical study and analysis which may be indicated.

Approximately eighty-five cards were used to record all of the information on each Astronaut candidate. Far fewer cards would be required for routine medical use. The use of a medical work sheet, together with card punch operators for recording medical information also has certain advantages and may be preferred for certain applications.

It is believed that some outgrowth of one of the methods of data recording should be applied to medical practice in order that the many advantages of modern data processing and handling may be realized in medicine.

Bibliography

1. Aerospace Medicine *(The Journal of Aviation Medicine,* recently re-named *Aerospace Medicine)* is considered to be one of the best general sources in this field and is published monthly.
2. Armstrong, H. G., Editor: Principles and Practices of Aviation Medicine. 4th Edition. Baltimore, Maryland: William and Wilkins, 1960.
3. Benson, Otis O., Jr., Editor: Lectures in Aerospace Medicine. Conducted at the School of Aviation Medicine, USAF Aerospace Medical Center (ATC), January 11-15, 1960, Brooks AFB, Texas. Available through the School of Aviation Medicine.
4. Benson, Otis O., Jr., and Strughold, Hubertus, Editors: Physics and Medicine of the Atmosphere and Space. The Proceedings of The Second International Symposium on the Physics and Medicine of the Atmosphere and Space. Sponsored by the USAF School of Aviation Medicine, Aerospace Medical Center (ATC), November 10-12, 1958, Brooks AFB, Texas. John Wiley & Sons, Inc., 1960.
5. Goodyear Aircraft Corporation, Akron, Ohio: Air/Space Crew Environmental Data Book, GER-9523, November, 1959.
6. Konecci, E. B.: Manned space cabin systems. *In* Advances in Space Science. New York: Academic Press, Inc., 1959.
7. McCormack, John A. (Chairman): Select Committee on Astronautics and Space Exploration. Space Handbook: Astronautics and its Applications. Staff Report of the Committee. Washington: Government Printing Office, 1959.
8. Proceedings of the "Manned Space Stations Symposium." Sponsored by the Institute of Aeronautical Sciences, April 20-22, 1960, Los Angeles, California.
9. Schwichtenberg, A. H., Flickinger, D. D., and Lovelace, W. R., II: Development and use of medical machine record cards in astronaut selection. U. S. Armed Forces M. J., 10:1324-1351 (Nov.) 1959.
10. Slater, L. E., Editor: Proceedings of "The Pilot Clinic on the Instrument Requirements for Human Comfort and Survival in Space Flight." Sponsored by the Foundation for Instrumentation Education and Research (FIER), October 26-27, 1959, Columbus, Ohio. FIER, 335 East 45th Street, N. Y. 17, N. Y., 1960.
11. Summary Session of "The Astronautics Symposium," Sponsored by USAF Office of Scientific Research and Convair Division of General Dynamics Corporation, February 18-20, 1957, San Diego, California.
12. White, C. S., and Benson, Otis O., Jr., Editors: Physics and Medicine of the Upper Atmosphere. The Proceedings of a Symposium sponsored by The Air University, School of Aviation Medicine, November 6-9, 1951, Randolph Field, Texas, University of New Mexico Press, 1952.

TRACHEOTOMY

124 B.C. to 1960 A.D.

ROBERT E. PRIEST, M.D.
Minneapolis, Minnesota

IN PREPARING this material, the author has assumed that presidential addresses possess latitude not proper in other types of medical presentations. Much of the material used is taken from work done by me and by my associates over the past fifteen years. The present paper is in the nature of a summing-up of information and thoughts pertaining to tracheotomy. Much of it will be generally familiar to this audience, but it is hoped that it may still prove to be of interest.

In order to conserve time, discussion of several aspects of tracheotomy is being omitted: technique, complications, and instruments including automatic tracheotomes and new types of tubes will not be dealt with.

Tracheotomy was first described just after the beginning of the Christian era. It was credited to Asclepiades who lived in 124 B.C. It probably was first actually performed by Brassavola in 1546. In writing a history of tracheotomy, Goodall found only twenty-eight recoveries prior to 1825. Assuming that some obscure reports were not found, and that some cases were unreported, the number is pitifully small for a period of

Presented as a Presidential Address to the Minnesota Academy of Medicine, St. Paul, May, 1960.

Doctor Priest is Clinical Professor in the Division of Otolaryngology of the University of Minnesota Medical School, Minneapolis.

nearly 2,000 years. As Goodall says, "It is appalling to think of the vast multitude of unhappy infants who must have fallen victims of laryngeal diphtheria from the Hippocratic era to well on in the 19th century."

The increased prevalence of diphtheria in France in the first quarter of the 19th century was responsible for the final and convincing demonstration of the possibilities of tracheotomy by Bretonneau and Trousseau.

Before the 19th century, tracheotomy was contemplated only when suffocation was imminent. An occasional author advocates its early use; de Garengeot in 1720 said, "The operation is very dangerous. Few authors say they have performed it, and fewer still that it proved successful. The reason of it seems to be because they perform it too late, and when the patient is dangerously sick."

The word "cyanche," later spelled "Syanche," and "squinance," appears throughout early writings on tracheotomy. The term indicates severe inflammatory processes about the pharynx. Quinsy and probably inflammations of the floor of the mouth are included.

In 1546, Brassavola, an Italian physician, described opening the trachea of a boy who was nearly dead from an "abcess in the windpipe." This seems to be the first recorded successful case.

In 1620, Habicot reported the case of a fourteen-year-old boy who feared that he was about to be robbed. He wrapped nine gold coins in cloth and tried to swallow the package. It became impacted in the upper esophagus and pressed so hard on the trachea that it partially suffocated the boy. Habicot opened the trachea. Then with a leaden sound, he pushed the parcel into the stomach. In a few days, the boy passed money and cloth per rectum.

Habicot also reported the case of a boy wounded and left for dead. He opened the boy's trachea and removed a laryngeal blood clot. Habicot had two other successful cases, one an officer with a cut throat, and the other a young woman with a gunshot wound of the throat.

In 1714, Detharding recommended that the operation be done on persons apparently drowned. This recommendation was later reiterated by Heister (1739) and de Pouteau (1783) in order that all water might be got out of the lungs through a tube.

Part of the account of the first British tracheotomy, as quoted by Guthrie, is given below. The operation was done and reported by George Martine of St. Andrews in 1730 as follows:

"I was called to a young lad who was all of a sudden taken ill with a violent trouble in his throat in which however I could see nothing wrong. He had great pain and Dyspnoea, with an Impossibility of swallowing. I reckoned it an Angina of one of the worst kinds, and the seat of the disease in the larynx and top of the gullet. Notwithstanding repeated Bloodings, Blistering, Cupping, etc., the Disease continued to be obstinate and the patient so like to suffocate that next day in the afternoon, his Friends, although very averse in the morning, when I first proposed the piercing of the Wind pipe, at length earnestly desired that the Operation might be performed; and the poor Lad bade us try any Experiment to preserve his Life. In a few hours he would have strangled to death most miserably. *Whence you see it was not of an itching Desire of making Experiments, or a wanton Officiousness, that we directly set about the operation.* Which was done with such success, that in less than four Days, his Breathing being perfectly easy, we removed Cannula and left the Glottis to do its own Office.

"Bronchotomy was proposed by Asclepiades 124 B.C., and is described by almost all Writers of Surgery from Paulus of Aegina (625-690 A.D.) and Antyllus (3rd Century A.D.) down to the present time. *But they are at so much pains to defend the Reasonableness of it, without mentioning their own Performance of the Operation, that I myself think it has very seldom been reduced to practice.*"

Here the writer discusses the history of tracheotomy, and gives a description of the operation. Then he proceeds—

"The Cannula should not be made near so short as is ordinarily proposed. The Parts may be so much tumified that it will require a Pipe above an Inch long to penetrate sufficiently into the Aspera Arteria. There would be less Hazard of a stoppage if the Cannula were shorter and wider. I cannot but think it an ingenious proposal of one of our Ministers here to make the pipe double, or one within another; that the Innermost might be safely and easily taken out and cleaned, without any Molestation to the Patient. We found no Inconven-

ience to our Patient's breathing the Air as it passed through the Pipe, without any cleaning or intercepting Medium, though the House was none of the cleanest, being an ordinary Tradesman's here.

"And now I cannot but notice the needless Pain some Writers are in about healing up the Wound by Bandaging, Stitching, etc. For we found it easily to fill up of itself in a very few days.

"Upon the Subject I should not have had so much to say if this elegant Method of rescuing one from imminent Danger, and the most difficult kind of Death, had not been ordinarily described more from Theory than from Practice, and if Surgeons had been half as bold as to assist Nature in such an Extremity as they are officious to disturb her regular and salutory steps."

The technique of tracheotomy evolved slowly. Early operators were afraid to incise cartilage because it was known to heal slowly. They used a transverse incision in skin and trachea.

Tracheotomy tubes were straight and short at first (Fabricius, 1619) and were so illustrated as late as 1795 (Latta's "Surgery"). Casserius (1561-1616) suggested a curved tube with holes in all directions. Sanctorius (1561-1636) advised a straight trochar such as is used in tapping a hydrocele. Martine was certainly the first to mention a double walled tube but he does not say that he used it.

Purmann of Breslau, in a volume entitled "Chirurgia Curiosa" describes "bronchotomy." Purmann is quoted by Guthrie as follows:

"In this manner," he writes, "I opened the Aspera Arteria in Mr. Christian Pfenning Mauven, a linen draper at Munden, in 1672. He was 39 years of age, had a violent Swelling in his Throat and was sometimes ready to be choaked. The Operation being as happily Performed as could be desired, the Patient was perfectly recovered from Death to Life."

A most interesting case report is given below. It is quoted from Guthrie's paper and was originally reported in the *Memoirs of the Royal Academy of Surgeons of France.*

"It appears that, in 1733, a London surgeon named Chovell persuaded a condemned man, a highwayman named Gordon, to allow him, for a substantial fee, to perform tracheotomy upon him the night before his execution. This surgeon had tried the experiment on several dogs and always with success, but his human subject, although still alive when cut down by his friends after the hanging, succumbed very soon. That the case aroused considerable interest is shown by the following anecdote, which Louis appends to his account.

"He tells us that shortly after the execution, three London citizens were stopped on the highway by thieves. One of the three, with great presence of mind, passed himself off as Chovell the surgeon. This name rendered the ruffians so polite that they not only returned his purse, but insisted on accompanying him to London, to protect him from any other attack!"

Until 1930, tracheotomy was reserved for cases of respiratory obstruction at or above the level of the larynx, but Wilson, in 1932, and Davidson, in 1936, suggested tracheotomy for the relief of respiratory insufficiency due to the bulbar form of poliomyelitis, according to Cawthorne.[2] About this time, Cawthorne continues, tracheotomy was suggested as an alternative to repeated bronchoscopy for the removal of secretions in acute laryngotracheobronchitis in children. Galloway, in 1943 and 1947, advocated tracheotomy in various childhood respiratory diseases including bulbar poliomyelitis.[3,4]

In 1947, Priest, Boies and Goltz summarized their experiences with tracheotomy in patients with bulbar poliomyelitis treated at the University of Minnesota Hospitals and the Minneapolis General Hospital during the 1946 epidemic. During 1946, 1830 cases of poliomyelitis were treated in Minneapolis. Almost all occurred during the epidemic period. Approximately 400 were diagnosed as "bulbar" cases. Tracheotomies were performed in seventy-five of these.

Prior to this epidemic, the staff members of the various departments involved had had no experience with tracheotomy in poliomyelitis. Using the few published reports as a guide, tracheotomy was employed cautiously. As the epidemic progressed, the indications became clearer.

As a result of our experience, we said that "we believe that tracheotomy had an important place in the treatment of bulbar poliomyelitis. In certain patients, we think it is a life-saving procedure. There is reluctance on the part of some physicians to accept tracheotomy as a useful adjunct in the treatment of poliomyelitis. Any physician whose experience with bulbar poliomyelitis encompasses only a few cases may question the need for tracheotomy. However, an epidemic

in which several hundred bulbar cases occur produces a considerable number which meet the criteria for tracheotomy outlined in this paper."

In a thorough search of the literature from 1900 through 1946, we found no report of a large group of poliomyelitis patients subjected to tracheotomy. No further reports were found in a bibliography covering the literature from 1789 to 1944.

As might have been anticipated, the reactions of the medical world were varied. Some authors took issue with the Minnesota group, saying its treatment of certain cases had been too radical and might even have prejudiced the chances for recovery of some patients. Other commentators agreed with the Minnesota group.

Five years after the 1947 publication, Priest, Boies, Goltz, Younger and Koller[5] undertook to review the world's literature to assess the opinions expressed concerning tracheotomy in bulbar poliomyelitis. About twenty-six papers on tracheotomy on bulbar poliomyelitis has been published since 1947. These represented all shades of medical opinion. Some criticism was truly bitter, but it is of interest that the bitterest critics had not used the method. The preponderance of opinion favored the method.

A large poliomyelitis epidemic in Denmark finally convinced the medical world that tracheotomy could be a life-saving measure in respiratory obstruction arising from any part of the respiratory tract.[2]

The tendency for more and more operations to be done for respiratory emergencies other than the traditional one of laryngeal obstruction is well illustrated in Table I, made up from figures quoted by Nelson (1958).[2]

TABLE I

	For laryngeal obstruction	For other causes of respiratory insufficiency
1940	98%	2%
1954	53%	47%
1958	48%	52%

Thus, within the past twenty years, the indications for tracheostomy have extended beyond the classical and obvious one of relieving obstruction to the entry of air into the tracheobronchial tree, and now more than half the operations are performed to prevent or to overcome respiratory insufficiency from other causes.

Quoting Cawthorne further:

"The extended use of intratracheal anesthesia and in particular the use of closed circuit machines made the anaesthetists appreciate the potential danger of dead space air, particularly when the breathing was shallow. From this has come the realization that, in the shallow respiration of profound unconsciousness, the reduction of the dead space air from 150 c.c to 50 c.c. by means of tracheostomy may in itself be life saving.

"Finally, the introduction by anesthetists of the cuffed intratracheal tube, which effectively isolates the lower respiratory tract from the digestive tract and at the same time allows for positive pressure respiration, has solved the problem of 'inhalation pneumonia,' and has rendered the iron lung almost obsolete; and there can be few, if any, of those who have had to cope with patients in iron lungs who will regret this.

"The stimulus for this last step came from Denmark when, in 1952, they were struck by a serious epidemic of poliomyelitis with many cases of respiratory paralysis and not enough iron lungs to go around. They had to improvise, and by means of tracheostomy with cuffed tubes and by using teams of medical students to operate manually the positive pressure apparatus, many lives were saved. This led to the development of the mechanical positive pressure breathing machine."

An outstanding contributor to this phase of the extended use of tracheotomy is a member of this society, Dr. Frederick Van Bergen.[7]

Recently, trauma to the head, face, neck and chest has provided many indications for tracheotomy. In times past, most tracheotomies were done to relieve obstruction of the airway caused by inflammatory conditions or neoplasms. Acute injuries of rather severe degree are becoming more common in our modern civilization with its rapid transportation.[8]

Tracheotomy is a useful procedure in head injuries with cerebral concussion, even though the face and neck are not injured. In the unconscious patient, the jaw relaxes, the tongue falls back into the throat, and evacuation of secretion from the pharynx by voluntary means under control of the patient ceases. Pooling of secretion in the pharynx may occur, and aspiration of this secretion may follow. Aspiration of vomitus is not uncommon. The use of feeding tubes produces irritation of the pharynx and causes more secretion to be formed in the pharynx. Cough reflex is at a minimum of efficiency. The use of tracheotomy to permit frequent and adequate cleansing of the lower respiratory tree has grown

steadily in recent years. Similar indications exist in barbiturate and other poisonings.

Jaw fractures, injuries to the front of the neck with edema of the pharynx, and fracture and edema of the larynx make it necessary to provide an airway by opening the trachea below the point of injury; inability of the patient to clear his own airway may occur in these conditions, as well as in cerebral concussion or poisoning.

Tracheotomy in burns may be necessary because of aspiration of hot gases which cause edema of the larynx. In World War II, it was found that aviators who were apparently in good condition when rescued from burning aircraft sometimes died unless "prophylactic" tracheotomy was performed; secondary swelling of the laryngeal interior occurred, and the patient died of asphyxia even though all other potential causes for death were under control.

During the past few years, the use of tracheotomy in the treatment of chest injuries has become more and more widespread. The purpose of tracheotomy in chest injury is twofold. Cleansing the lower respiratory tree by suction through the tracheotomy is probably the most important reason for doing tracheotomy in chest injuries. A second indication occurs in the so-called "flail chest." Here a large segment of the chest wall "floats," and there is paradoxical motion on respiration. When the patient breathes in, the flail segment of the chest goes in instead of out, because it is no longer anchored to the rest of the chest wall.

It has been shown by several authors that patients with flail chests do better with tracheotomies, because the total volume of air moved during the respiratory act is reduced. Resistance of air coming in through the tracheotomy is less than through the nose and pharynx. Experimental work measuring pressures in the pleural spaces before and after tracheotomy in human beings and in dogs has shown a definite advantage in the case of tracheotomy.

Positive pressure can be applied during the inspiratory phase of respiration to provide stabilization, or at least partial stablization, of the flail segment of the chest. This reduces pain and also increases respiratory efficiency.

Tracheotomy for relief of secretional obstruction in unconscious patients is not confined to head injury cases. It is useful in central nervous system vascular accidents, poisonings, botulism,[9] and drug overdosage, when the patient cannot clear his own airway of secretion. Of course, tracheotomy does nothing to overcome the primary disease *per se*. But it removes one deleterious factor from the patient's course, and hence allows him to be able better to overcome the primary disease.

Summary

Tracheotomy was described in 124 B.C., but was first performed in 1546 A.D. Up to 1825 A.D., only twenty-eight recoveries were found recorded in medical literature. Assuming that some obscure reports were not found, and that some cases were unreported, the number is pitifully small for 2,000 years. In the 19th century, diphtheria in France demonstrated the advantages inherent in tracheotomy.

Until about 1930, tracheotomy was used only when suffocation from airway obstruction above or in the larynx existed. Then its value in overcoming secretional obstruction was recognized. Since then, its usefulness in bulbar poliomyelitis, head injury, burns, drug and microbial poisonings, chest injury, as well as in laryngeal and pharyngeal obstruction, have become apparent. The operation described by Fabricius of Aquapendente (1537-1619) as "the scandal of surgery" has now assumed a respected place in man's therapeutic arsenal.

References

1. Priest, R. E.: History of tracheotomy. Ann. Otol., Rhinol. & Laryngol., 61:1039, 1952.
2. Cawthorne, Terence, Hewlett, A. B., and Ranger, Douglas: Discussion: Tracheostomy today. Proc. Roy. Soc. Med., 52:403-414 (June) 1959.
3. Galloway, T. C.: Tracheotomy in bulbar poliomyelitis. J.A.M.A., 123:1096-1097 (Dec. 25) 1943.
4. Galloway, T. C.: Management of respiratory complications of poliomyelitis. Arch. Otolaryng., 46:125-136 (Aug.) 1947.
5. Priest, R. E., Boies, L. R., Goltz, N. F., Younger, L. I., and Koller, R. L.: The present status of tracheotomy in bulbar poliomyelitis. Ann. Otol., Rhinol. & Laryngol., 60:468-483 (June) 1951.
6. Nelson, T. G.: Tracheotomy, A Clinical and Experimental study. Quoted by Cawthorne.[2]
7. Van Bergen, F. H., Buckley, J. J., Weatherhead, D. S. P., Schultz, E. A., and Gordon, J. R.: A new respirator. Anesthesiology, 17:708-723 (Sept.-Oct.) 1956.
8. Priest, Robert E.: Tracheotomy in the acutely injured patient. Minnesota Med., 40:856-858 (Dec.) 1957.
9. Bofenkamp, B., and Priest, R. E.: Tracheotomy in botulism. Ann. Otol., Rhinol. & Laryngol., 58:1093 (Dec.) 1949.



Fig. 1. *(a)* When seen initially, the patient had soft, nodular, dome-shaped lesions that had begun as papulovesicles a week before. *(b)* Four weeks later, the lesions had resolved almost completely with local antibiotic therapy and wet dressings.

Orf:

A viral disease of sheep bearing the fascinating name of "orf" is a hazard of sheep farmers. Although the disease is severe in sheep and goats, it practically always is mild in humans, being confined to the skin. Sheep farmers presenting dome-shaped, soft, moist, deep-red cutaneous nodules may have orf. If you like to collect new diseases, why don't you scan this little article?

ORF (ecthyma contagiosum) is a disabling or even fatal disease of sheep and goats that often results in losses among lambs and kids amounting to hundreds of thousands of dollars annually.[1] Humans are also susceptible to the virus and, in many parts of the world, this infection is a common occupational disease among sheep farmers.[2] In Minnesota, its rarity may be less apparent than is actually the case, inasmuch as the disease may be unrecognized.

From the Section of Dermatology, Mayo Clinic and Mayo Foundation.

Read at the meeting of the Southern Minnesota Medical Association, Mankato, Minnesota, September 12, 1960.

Dr. Farmer is a Fellow in Dermatology, Mayo Foundation.

The Mayo Foundation, Rochester, Minnesota, is a part of the Graduate School of the University of Minnesota.

Report of Case

A twenty-seven-year-old sheep farmer from southwestern Minnesota recently came to the Mayo Clinic because of isolated "sores" over the right arm, left shoulder and face. He was primarily concerned about the cosmetic disfigurement produced by the lesions. He felt well and was essentially asymptomatic except for slight tenderness localized to each of the involved zones. All the lesions had begun at about the same time, which was one week before he came to the clinic. He first noted papulovesicles that later became confluent to form moist, dome-shaped lesions with some superficial crusting.

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Fig. 2. Biopsy from a lesion on the right arm shows the histologic picture of an acute viral infection. The epidermis is acanthotic, with intra-epidermal vesicles resulting from reticular degeneration of epidermal cells. A mild inflammatory infiltrate composed mostly of lymphocytes is present in the dermis.

An Occupational Disease in Minnesota

He had raised sheep for several years, at present having a total of 225 sheep, 105 of which were lambs; sixty of the lambs had orf, or sore-mouth disease. The local veterinarian suggested that he treat the infected animals with a disinfectant spray; while carrying out this program, the patient sustained multiple scratches and abrasions about the hands and forearms. Within five to seven days, he noted small isolated zones of papulovesicles on the right forearm, left shoulder and face at the sites of the trauma.

Examination revealed a young white man in apparent good health. He was afebrile and did not have any lymphadenopathy. The positive physical findings were limited to the skin and consisted of six nodular lesions measuring from 0.5 to 1.0 cm. in diameter. Four of these lesions were on the face, one was on the right arm and one was on the left shoulder. All the nodules were similar in appearance, being dome-shaped, soft, moist and deep red, with slight superficial crusting that partially obscured a clean, moist, granular surface (Fig. *1a*). A slight inflammatory halo surrounded each lesion.

Therapy consisted of the local application of an ointment (neosporin) containing polymyxin B sulfate, neomycin sulfate, zinc bacitracin and petrolatum. This was applied to each lesion several times daily, alternating with wet dressings moistened with tap water, which were applied at intervals to remove the accumulated crusts and exudate.

At the end of two weeks, most of the lesions had begun to regress; however, one new lesion had developed in the left supra-orbital region. At the end of four weeks, the lesions showed further regression (Fig. *1b*). Three months after the initial visit, all the lesions had healed, with little or no scarring.

Comment

The term "orf" is derived from the old Anglo-Saxon word for cattle; in its modern usage, however, it refers to a viral disease occurring primarily among sheep and goats.[3] The disease is world wide in distribution. It was first reported among sheep in the United States in 1928 and is now known to be widely distributed throughout the sheep-raising areas of this country.[1,4]

The virus that causes orf belongs to the genus Borreliota, or the pox group of viruses. It is comparatively large, probably being nearly the size of the vaccinia virus. Elementary bodies have been observed with the light microscope by staining for the Paschen bodies of variola.[5]

Orf should not be confused with sheep pox, as the two are separate and distinct diseases. Orf is a benign viral disease of the dermotropic type, and it does not present systemic manifestations when the condition is uncomplicated. Sheep pox, somewhat analogous to smallpox in man, is a systemic viral disease in which the cutaneous involvement is only one facet of the infectious process.

Animals other than sheep and goats at times may acquire the infection. The chamois, a goat-like antelope found in the mountains of Europe, is highly susceptible, and a mild form of the disease has been produced in rabbits. Some question exists as to whether cattle, horses, dogs and guinea pigs are susceptible. Rats, mice, chickens and pigs apparently possess natural immunity.[6]

Human infections have occurred in all parts of the world.[3,6-8] Kewish[2] reported that the disease is common in Australia among sheep shearers; he recorded thirty-eight cases over a four-year period, with a total loss of 254 man-hours of work. Schoch[9] reported the first human case in the United States, in 1939. Since then, the disease has been seen frequently among humans in the western and southwestern United States, with occasional cases occurring in the east and midwest.[6,10]

In man, the disease usually is acquired as a result of direct inoculation from infected animals; consequently, it is seen most often among sheep farmers, veterinarians and meat handlers. Isolated lesions occur on the hands, fingers and wrists, with occasional lesions on the face apparently resulting from the transfer of infected material by the fingers. The characteristic lesion is usually a deep-red, moist, soft, dome-shaped nodule with superficial crusting. Bullous and ulcerative lesions occur less frequently. The histologic appearance is characteristic of that associated with acute viral infection (Fig. 2). Without secondary infection, the lesions heal spontaneously over a period of four to eight weeks, with little or no scarring. Constitutional symptoms are usually absent but there may be mild lymphangitis as well as local tenderness and pruritus.[5,7,11]

The disease may not always be mild, however; the German literature includes a report of a generalized vesicular eruption following the primary infection.[12] A British report documents a case of erythema multiforme occurring fifteen days after the development of the initial lesions.[13] Kewish stated that one of his cases of extremely fulminating orf occurred in a housewife in whom multiple lesions developed after she had washed her husband's overalls, which were full of "burrs and grease." In this case, typical lesions developed within twenty-four hours, followed by rigors and drenching sweats, with a temperature of 104.8° F. Improvement was noted after three days, and complete recovery followed. In 1936, Cook[14] reported a case of fatal acute pemphigus occurring in an Australian sheep shearer; it was not definitely established, however, that orf had preceded the acute fatal reaction.

The conditions that most commonly might be confused clinically with orf are impetigo and inflammatory ringworm infections. Vaccinia, tularemia, sporotrichosis and milker's nodules also should be included in the differential diagnosis.

The history is of prime importance when the clinical findings are confusing, because almost all human infections occur as the result of direct inoculation from infected animals.

No specific treatment is available. Since orf is a self-limited disease, the medical management should be directed toward the prevention of secondary infection and the relief of local symptoms. This can be achieved best by the use of antibiotic ointments and wet dressings.

There are no specific laboratory studies that will help in making the diagnosis. As already indicated, the histologic picture is that of an acute viral infection without specific diagnostic features.

Lambs are particularly susceptible to the disease, and the natural infection occurs shortly after the lambs are put to pasture in the spring. A few lambs become infected from the dried crusts containing the viable virus that lie about the pasture from the previous season. The lips, nose and periorbital regions are the sites of predilection. Reddened zones appear first, on which papules, vesicles and pustules develop. These rupture to give rise to a purulent exudate that dries to form brownish-gray crusts.[7] Papillomatous and ulcerative lesions may develop. The lips become swollen, stiff and exquisitely tender. The lamb cannot suckle or graze. It looks miserable and loses weight rapidly. In uncomplicated disease, the crust drops off about the twenty-fourth day, leaving a smooth soft skin without scarring. Systemic manifestations usually are absent. After the disease has developed in a few of the lambs, the infection spreads rapidly throughout the flock as a result of direct contact and contaminated food and water. Ewes which are not immune also will display lesions about the udder, vulva and inner part of the thighs as a result of nursing the infected lambs. After the initial infection, the sheep are highly immune.[1]

Secondary infection with bacteria or infestation with the larvae of the screwworm fly constitutes the most serious aspect of the disease. In such cases, lesions may extend into the buccal cavity to involve the palate, tongue and pharynx. Secondary bronchopneumonia may result in death.[1,15]

A vaccine prepared from the dried crusts is available and is highly effective. Only 0.38 per cent of a large group of vaccinated animals subsequently had the disease, whereas 65 per cent of an unvaccinated control group acquired the infection.[1,15]

Summary and Conclusions

A case of orf in a Minnesota sheep farmer is presented. The course of this viral disease as it occurs in both humans and animals is reviewed. The disease, usually in a benign form, is not uncommon among humans in sheep-raising regions, and it can be easily diagnosed if its history and clinical features are kept in mind. Orf constitutes a serious disease of sheep, influencing the commercial production of lambs. Because it may at times affect those persons engaged in sheep raising, it is an occupational disease of such persons.

References

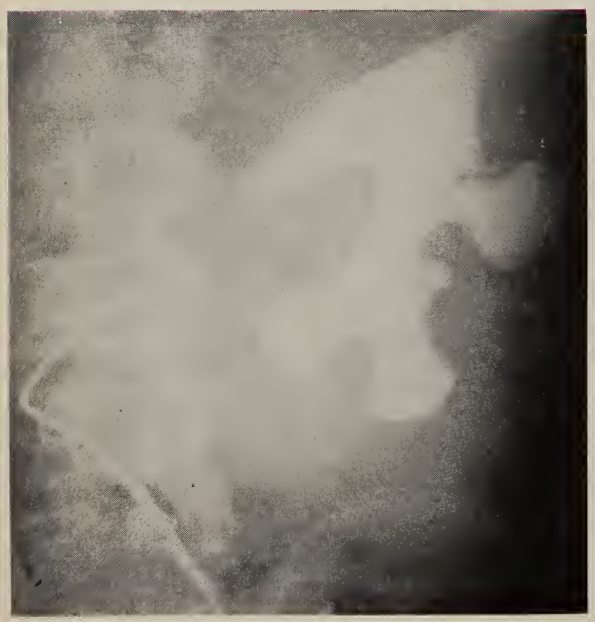
1. Boughton, I. B., and Hardy, W. T.: Contagious ecthyma (sore mouth) of sheep and goats. Am. Veterinary M. A. J., 85:150-178 (Aug.) 1934.
2. Kewish, O. K.: Sheep shearers get orf. Brit. M. J., 1:356 (Feb. 17) 1951.
3. Hodgson-Jones, I. S.: Orf in London. Brit. M. J., 1:795-796 (Apr. 14) 1951.
4. Howarth, J. A.: Infectious pustular dermatitis of sheep and goats. Am. Veterinary M. A. J., 75:741-760 (Dec.) 1929.
5. Merchant, I. A.: Veterinary Bacteriology and Virology. Ed. 4, 885 pp. Ames, Iowa: The Iowa State College Press, 1950.
6. Wheeler, C. E., Cawley, E. P., and Johnson, J. H.: Ecthyma contagiosum (orf). A.M.A. Arch. Dermat., 71:481-485 (Apr.) 1955.
7. Nomland, Ruben: Human infection with ecthyma contagiosum, a virus disorder of sheep: Report of two cases. Arch. Dermat. & Syph., 42:878-883 (Nov.) 1940.
8. Peterkin, G. A. G.: The occurrence in humans of contagious pustular dermatitis of sheep ("orf"). Brit. J. Dermat., 49:492-497 (Nov.) 1937.
9. Schoch, Arthur: Sheep pox infection in man. Arch. Dermat. & Syph., 39:1040-1041 (June) 1939.
10. Kingery, L. B., and Dahl, Joyle: Ecthyma contagiosum in man: Data concerning its incidence in several western states; Report of a case. Arch. Dermat. & Syph., 51:359-364 (June) 1945.
11. Lyell, A., and Miles, J. A. R.: Orf in man. Brit. M. J., 2:1119 (Nov. 11) 1950.
12. Oppermann, T., and Stümpke, G.: Der Lippengrind (Ekthyma contagiosum) der Schafe und seine Übertragbarkeit auf den Menschen. Arch. Dermat. u. Syph., 176:337-346, 1937.
13. Blakemore, F., Abdussalam, Mohammad, and Goldsmith, W. N.: A case of orf (contagious pustular dermatitis): Identification of the virus. Brit. J. Dermat., 60:404-409 (Dec.) 1948.
14. Cook, E. A.: Acute pemphigus: Report of a fatal case occurring in a shearer. M. J. Australia, 1:505-507 (Apr. 11) 1936.
15. Aynaud, M.: La stomatite pustuleuse contagieuse des ovins (chancre du mouton). Ann. Inst. Pasteur, 37:498-527 (May) 1923.



Fig. 1. Small hypernephroma.

Detection of

Fig. 3. Larger hypernephroma.



THERE IS no sure-fire, ironclad, fool-proof method of detecting cancer in the urogenital system. A high index of suspicion is the most important single factor in success; hematuria, pain, the presence of a mass, and obstruction to urination oftenest arouse that suspicion. Ideally, of course, one would detect the growth before it caused symptoms, but that ideal is rarely achieved except in the case of prostate. While early recognition of most lesions of the urinary tract can be achieved now, the elaborate, expen-

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From the Urological Division of the Department of Surgery in the Medical School of the University of Minnesota.

Given before the Minnesota State Medical Association at Rochester on May 24, 1960.



Fig. 2. Aortogram of large tumor.

Genitourinary Cancer

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sive, and often unpleasant methods required make this impracticable for routine use in "well" patients.

Consequently, one waits hopefully, if pessimistically, for the development of a simple and reliable test for cancer.

Careful questioning, palpation, roentenography, as well as cystoscopic and histologic studies ordinarily will lead to a precise diagnosis.

Malignant tumors of the kidney are divided into parenchymal and pelvic types, with the second of which ureteral growths may as well be considered. Benign lesions large enough to manifest themselves clinically are rare. A *parenchymal tumor* is suspected in any case of hematuria, renal pain, a palpable renal mass, atypical neoplasms of bone, unexplained toxemia with fever and anemia, and unusual polycythemia. The absence of a palpable mass means nothing because the kidney is so well padded by surrounding structures—except in thin people. An accelerated sedimentation rate is a non-specific reaction present in one fourth to one third of these tumors, but is of assistance mainly in deciding the nature of a suspected mass. A neoplasm of the left kidney in the presence of any dyscrasia of the blood is likely to be mistaken for splenomegaly —such a combination should lead one to suspect the kidney.

The diagnosis can usually be made by excretory urography, remembering that globular, encapsulated neoplasms cause pyelographic deformities identical with those of simple cysts. If the excretory urogram is unsatisfactory, a retrograde pyelogram may resolve all doubts (Figs. 1 and 3).

Papanicolau stain of the urinary sediment yields too many negative reports to be really useful, and the cellular pheomorphism of many of these neoplasms is confusing in the stained smear.



Fig. 4. Simple renal cyst.

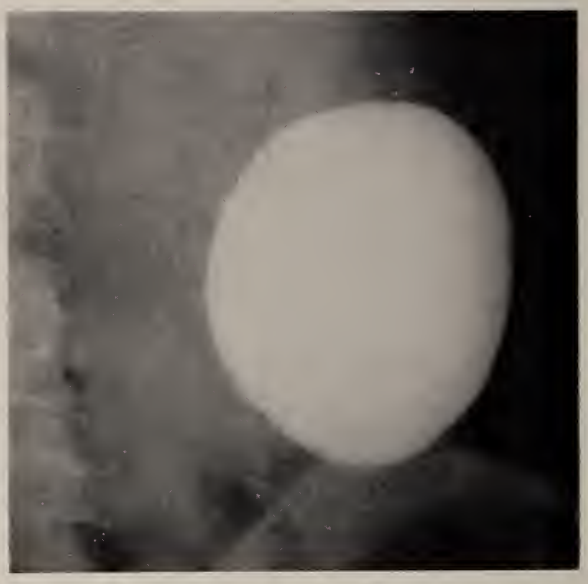


Fig. 5. Cyst injected.

When the pyelographic and other evidence is uncertain, aortography is likely to be conclusive (Fig. 2), although some cite the possibility of serious complications as contraindicating its use. These appear to result from technical errors. Occasionally the aortogram may be misleading if the circulation of the tumor is poor. When the preponderance of evidence favors cyst and the patient is a poor surgical risk, it may be desirable to aspirate the mass and, if clear fluid is recovered, to replace it with contrast agent, thus getting a diagnostic "cystogram" with smooth, sharply defined, rounded margins (Figs. 4 and 5). Irregularities in its margin, the presence of filling defects in the cyst, or inability to aspirate or fill it call for surgical exploration.

Pelvic and ureteral tumors produce palpable masses only when so situated as to cause large hydronephroses, or when they infiltrate the ureter in a palpable area (vagina, rectum). However, virtually all of them are readily identifiable on excretory or retrograde pyelography, usually undertaken because of hematuria (Fig. 6); one must remember that both pelvis and ureter may be involved simultaneously. Aortography is of no value because these tumors are relatively avascular. The Papanicolau stain is more likely to be positive than in parenchymal tumors because the lesions are bathed by the urine, but negative tests are of no value.



Fig. 6. Papillary epithelioma.



Fig. 7. Wilms' tumor.

Wilms' tumors are always suspected in infants and children, particularly under the age of two years, in the presence of a smooth, firm abdominal mass in the region of the kidney. There are many who contend that the presence of an abdominal mass in childhood constitutes a surgical emergency. This is objectionable, to put it mildly, because the general application of this policy by those not competent in urological diagnosis has led to such tragedies as the removal of a solitary kidney, and to such gross blunders as the excision of a salvageable hydronephrosis, et cetera. The advocates of this policy remind me of slightly addled Sir Galahads leaping upon their white chargers and riding off in all directions at once without regard for the consequences—exciting, but not an exhibition of good judgment.

Excretory urography ordinarily suffices for diagnosis, but may have to be supplemented by retrograde pyelography, for which there is always time available (Fig. 7).

In the infant, one should always try to transilluminate the mass with a small source of intense light, such as is provided by a cystoscope bulb, in a completely dark room; if the light shines through, the mass is not a neoplasm, and any idea of urgency can be abandoned.

Tumors of the urinary bladder usually cause hematuria, and are rarely identifiable by physical examination, unless they infiltrate the base of the bladder so as to be palpable on bimanual pelvic or rectal examination. Excretory urography, which should *always* be done in the presence of hematuria or vesical irritation, will be normal if the tumor is too small to displace a visible amount of contrast agent. Larger ones produce central or peripheral filling defects (Figs. 8 and 9), but cystoscopic biopsy is always necessary for definitive diagnosis, regardless of roentgenographic appearances. The cystoscopic examination should be done under anesthesia so that one will not be tempted to hurry because the patient is being hurt, and because the relaxation facilitates adequate bimanual examination. Soft lesions are biopsied with cystoscopic forceps, but hard ones call for the resectoscope so that a generous sample can be removed; it should include part of the base and an edge of the tumor.



Fig. 8. Vesical papillomata.

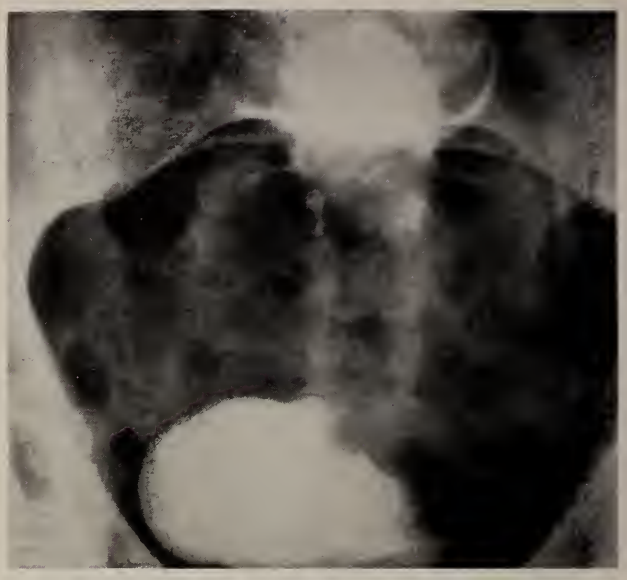


Fig. 9. Vesical carcinoma.

In the case of the *prostate gland,* urinary symptoms are nonspecific; both cancer and benign hypertrophy cause the same kind of obstruction. Suspicion is aroused by troublesome sacral backache (mestastasis) and sciatic pain (local infiltration). The significant physical finding is stony induration, whether in the form of a small nodule, or of extensive invasion, enlargement, or fixation.

acceptable evidence that the "prostatic" phosphatase is more sensitive than the standard test. If the acid phosphatase level is equivocal in the presence of suspicious findings, it may sometimes be made to rise by the intramuscular injection, on alternate days, of a series of several 25-mg. doses of testosterone propionate. Roentgenograms of the lumbar spine and pelvis may show the typical osteoblastic or the uncommon osteoclastic



Fig. 10. Osteoblastic metastases.

If the tumor has metastasized, the serum acid phosphatase will be elevated in from 70 to 80 per cent of the patients. There is as yet no

metastases (Figs. 10 and 11). If these and a definitely elevated acid phosphatase are found together, the diagnosis is definite.



Fig. 11. Osceolastic metastases.

The isolated nodule without other manifestations requires biopsy. If the lesion is fair-sized *and no curative operation is contemplated,* needle biopsy is useful, but fails oftenest where most needed, that is, the smallest nodules are the hardest to sample. Transrectal biopsy with a special punch has become popular, but I do not believe that it should be used for potentially curable lesions, lest the definitive operation be followed by a recto-urethral fistula. It is, however, handy for inoperable lesions where tissue must be secured before castration, an operation which should not be used in cancer of the prostate without absolute proof of malignancy.

Open biopsy should be used with small isolated nodules in patients under seventy and in good condition, and should be followed at once by total prostatovesiculectomy if the frozen section is positive, because this operation yields fifty per cent of durable cures. The Papanicolau stain of the expressed prostatic secretion has been advocated as a diagnostic method, but positive results are relatively infrequent, and there is grave doubt as to the propriety of massaging a suspected cancer.

Cancer of the urethra is rare in both sexes. In the male it manifests itself oftenest as rather profuse bleeding after dilatation of an old stricture. A hard lump is then palpated along the course of the urethra, and biopsy, usually with the urethroscope or through an incision, discloses the nature of the lesion. Urethrography may show a mass with ragged margins intruding into the urethral lumen but is not absolutely diagnostic.

In the female, attention may be drawn to the disease by a little dysuria, perhaps with scanty bleeding. A "caruncle" which bleeds or is firm to hard in consistency should be excised *in toto* for microscopic examination. Either urethral bleeding or induration along the canal calls for urethroscopic examination with biopsy of any area of thickening, induration, or ulceration. The resectoscope will permit securing a deep specimen. Since parts of the cancer may be covered by intact epithelium, a deep sample is essential (resectoscope).

All chronic ulcers and papillary lesions of the *glans penis* should be viewed with grave suspicion, as should induration beneath an adherent foreskin. Small visible lesions should be excised completely for biopsy (Figs. 12 and 13). A deep



Fig. 12. Papillary carcinoma penis.

wedge should be removed from larger ones. One assumes, naturally, that chancres will not be treated in this fashion. An adherent foreskin with subjacent induration should be slit on the dorum to permit inspection and biopsy of the underlying tissue.

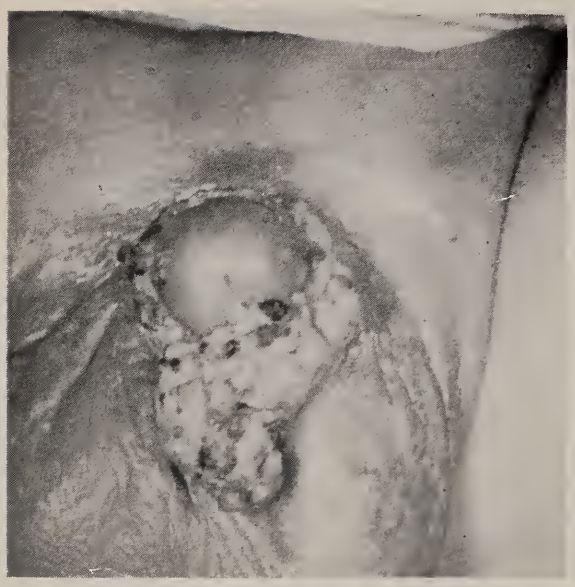


Fig. 13. Infiltrating carcinoma of penis.

The identification of *testicular neoplasms* is ordinarily relatively easy. In the average case there is a painless, insensitive, rather heavy, firm to hard, smooth or lobulated mass which usually retains the general shape of the testis. It cannot be transilluminated. Differential diagnosis in such a situation includes thick walled hydrocele, hematocele, tuberculosis of the epididymis, spermatocele, and gumma (I have never encountered one except in the pathological museum). One must be on the alert for the patient who is a poor observer and who says that his swelling came on abruptly while he was straining to defecate, or after a minor trauma.

Small localized nodules give more trouble, especially if they adjoin the epididymis and are a little tender. Spermatocele, spermatic granuloma, and localized epididymitis come into question. Spermatocele and hydrocele are readily identified by their consistency and by the fact that they can be transilluminated. The others may require exploration for final diagnosis (Fig. 14). The incision begins above the external ring and extends onto the upper scrotum. The spermatic cord is isolated and compressed with a rubber shod clamp while the testicle is extracted from the scrotum. If its appearance is not diagnostic, the tunica is opened; inspection will usually suffice for diagnosis. Biopsy of suspected testicular neoplasms is to be avoided because the growth potential is so great that local implantation of the tumor in the wound is probable. The Ascheim-Zondek and other pregnancy tests are of value only if positive; they are too often negative.



Fig. 14. Small testicular tumor.

Neoplasmas of the epididymis are rare. Most are benign, but those found in the testis also appear here. They are identified by their location; their consistency is like that of those in the testis. In general, a discrete nodule in the epididymis is best exised and subjected to frozen section diagnosis while the wound is protected from contamination.

Tumors of the spermatic cord are also uncommon. (I have seen one large lipoma). Consistency is that of lipomata elsewhere, and they are best identified by surgical exposure. Since the cord also contains muscle, connective tissue, and blood vessels as well as nerves, there are many other possibilities, recognition of the character of which depends upon microscopic study.

Summary

Detection of cancer in the genitourinary tract is a matter of suspicion followed by painstaking (and sometimes repeated) investigation. It is better to take the time necessary for accurate diagnosis than to leap to unwarranted conclusions.

Hypertension due to UNILATERAL RENAL DISEASE

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GOLDBLATT and others,[1] in 1934, showed that partial constriction by a metal clamp of both main renal arteries of dogs regularly resulted in persistent hypertension. Page[2] later produced chronic hypertension by investing both kidneys in cellophane. Others have produced similar effects by wrapping the kidneys in silk, tape, collodion or latex, producing an inflammatory reaction which constricts either the pedicles or the kidneys and behaves like renal artery constriction.

Complete denervation of the kidney or transplantation of the kidney to another part of the body does not interfere with these effects of ischemia—thus, the mechanism is a humoral one. Goldblatt also found that if the renal vein is obstructed at the same time the artery is constricted, no hypertension develops. Extracts of rabbit kidneys thus made ischemic have yielded on extraction a pressor substance called renin by Tigerstedt and Bergman.[3] Injection of this substance into other rabbits produced a sustained rise of blood pressure. Houssay and Taquini[4] found that the kidney is the only organ which when made ischemic is a source of the pressor substance. Normal kidney tissue has the ability to destroy or eliminate this pressor substance. Thus, if clamping one main renal artery leads to a moderate rise of blood pressure which tends to decline slowly, removal of the opposite normal kidney is followed by a prompt increase of blood pressure to the previously high level. All attempts to demonstrate the presence of this substance in the blood of hypertensive animals and man have been unsuccessful. Pickering[5] quotes several experimenters as finding a pressor substance in the renal vein blood after recent constriction of the renal arteries—they called it hypertensin. Renin is formed from the cortex layer of the kidneys—probably the tubules. It acts as an enzyme splitting

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Fig. 1. Intravenous pyelogram showing good filling of the right renal pelvis and calyces and little if any filling on the left side.



Fig. 2. Retrograde pyelogram showing normal retrograde filling of the left pelvis and calyces.

off hypertensin or angiotonin from a portion of plasma proteins called hypertensinogen.

In animals and man, where hypertension originally caused by ischemia of one kidney was allowed to continue for some time, removal of this kidney did not cure the hypertension. Some other mechanism then is called into play—with perhaps permanent damage to arterioles.

Wakerlin,[6] Johnson and Goldblatt showed that an anti-renin formed by injection of heterologous renin into dogs, prevents hypertension from renal artery constriction, or abolishes it if already established for a short time.

The clamped kidneys, due to reduced blood flow, are spared from the arteriolar changes noted in the opposite kidney resulting from the sustained hypertension.

Removal of the anterior lobe of the pituitary abolishes the hypertension due to renal ischemia, as does also total adrenalectomy. However, Pickering[5] states that there is no evidence that there is an increased secretion of adrenal cortical hormone to account for the chronic phase of hypertension secondary to renal artery constriction.

Braasch[7] reported that only 2.5 per cent of 4,000 hypertensive patients had a renal lesion and in only one-fifth of these did the disease present surgical potentialities.

In man, it must be proved that the renal disease antedated the hypertension and that the removal of the affected kidney produced return of blood pressure to a normal range well beyond the postoperative period. (One should allow one year to pass after surgery before claiming benefit from

the nephrectomy.) Hypertension has been reported relieved by nephrectomy for tumor, calculus, tuberculosis, hydronephrosis, unilateral pyelonephritis, and vascular lesions of the renal artery.

Recurrence of hypertension has occasionally been reported as late as three and one half years after some of these nephrectomies. Of 318 cases of nephrectomy for unilateral renal disease associated with hypertension which were reported in the medical literature up to 1954, 287 were followed over one year and seventy-seven patients were reported as "cured" of their hypertension. Of these, thirty-three had chronic unilateral pyelitis. Drs. Creevy and Reiser[8] at this University, in 1954, reported eight patients with unilateral renal disease with hypertension who underwent nephrectomy. Two of these had been normotensive for at least one year. They stated that there is no reason to believe that unilateral congenital renal hypoplasia can produce hypertension.

Reiser and Creevy[8] state that surgery for hypertension in patients with unilateral renal disease should be carried out only if:

1. There is a surgical indication for removal of the diseased kidney.

2. There is a non-functioning or poorly functioning kidney.

3. The contralateral kidney is hypertrophied and capable of sustaining life.

4. The hypertension has been present on several determinations.

5. The blood pressure elevation is of less than two years' duration.

6. There are no secondary irreversible hypertensive changes in other organs which in themselves make the patient inoperable.

The tests to be done before surgery should be: (1) intravenous urogram; (2) cystoscopy and retrograde pyelograms; (3) phenosulfonphthalein determinations for each kidney; (4) bacteriologic examination of each kidney; (5) aortography in some doubtful cases.

The prognosis is the best under the age of forty, especially in children where no vascular lesions have occurred in the opposite kidney.

Report of Case

Mr. B. L., aged forty-five, was first seen on August 24, 1956. Two weeks earlier, he had an episode of acute pulmonary edema. He was rushed to a hospital in Onamia, Minnesota, and placed in an oxygen tent. His blood pressure on arrival at the hospital was 290/140. Later it dropped to 210/120.

This man had passed an insurance examination one year prior to this incident at which time his local physician had reported a normal blood pressure. He had led an active life, selling fire-fighting equipment. He had not experienced headaches or vertigo.

His doctor at Onamia had obtained an intravenous urogram which showed nonfunction of the left kidney. The doctor referred him to Dr. Frederic Foley of St. Paul for investigation of his renal status.

Physical examination revealed minimal arteriosclerosis of the retinal vessels, without scars or fresh hemorrhages. His heart was at the upper limit of normal size. A2 was greater than P2. The patient was admitted to the Miller Hospital to rule out the presence of pheochromocytoma and/or the presence of unilateral renal disease.

His urine gave a 1 plus albumen reaction but no abnormal cells or casts.

The intravenous P.S.P. test gave 30 per cent excretion of dye at 15 minutes and 15 per cent at 30 minutes. BUN was 17 mgm. per cent. Sedimentation rate was 27 mm. BMR was plus 4 per cent. Fasting blood sugar was 130 mgm. per cent. Hemoglobin 16.2 gms. Red blood cell count was 5.03 million per cu. mm.; white blood cells, 10,850. Bromsulfthalein retention was 5 per cent at 45 minutes. One Benodaine and three Regitine tests gave normal or borderline findings.

An intravenous urogram showed no excretion of dye by the left kidney (Fig. 1). Two days later, Dr. Foley interpreted a retrograde pyelogram on the left (Fig. 2) as normal and from these two findings he diagnosed an infarcted left kidney. Three days later, a repeat intravenous urogram showed slight function in the left kidney (about 20 per cent).

The patient's blood pressures meanwhile were recorded in the range of 184/120 to 200/130.

A ureteral catheter was left in the left ureter, and for three successive days the output from this kidney was recorded as 30-150 and 300 cc. compared to a total urine excretion of 2500-3000 cc. for those days.

On September 12, the patient was allowed to go home, presumably to return in a month for re-evaluation of this left kidney function. One week later, his local physician found his blood pressure 196/128. Further readings of blood pressure at home in the following week were in the range of 190-200 systolic and 120-130 diastolic. He re-entered Miller Hospital on September 25 and on the next day a left nephrectomy was carried out by Dr. Foley.

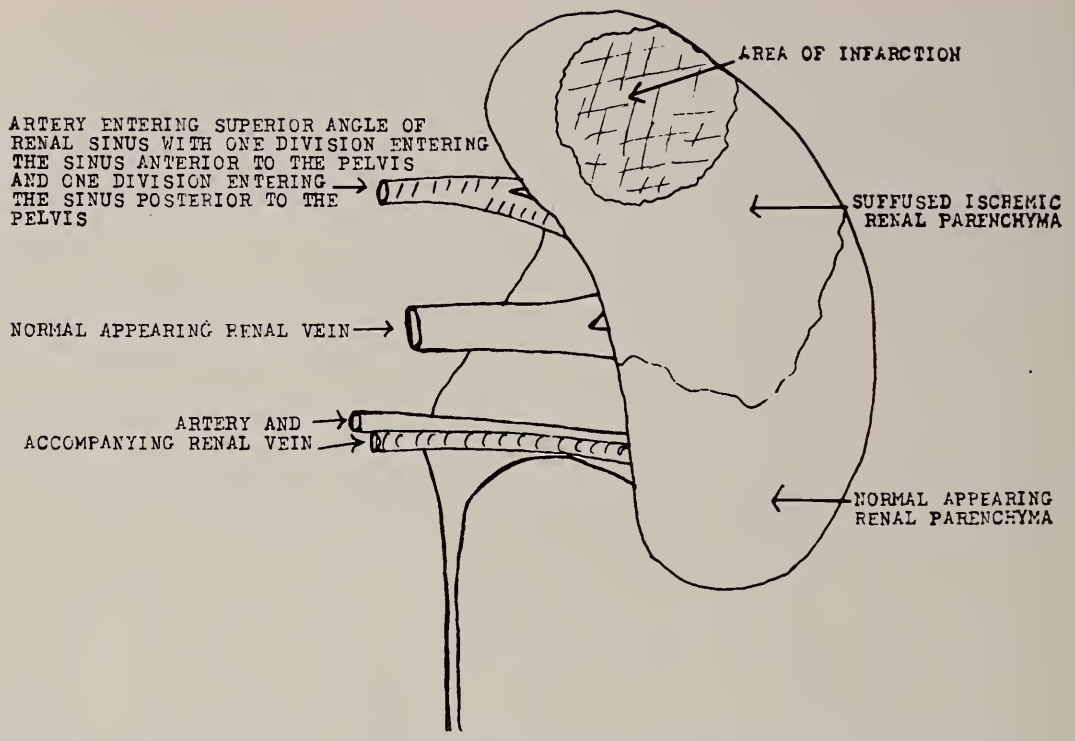


Fig. 3. Diagram showing infarcted upper three-fourths of left kidney due to thrombosis of left main renal artery. The viable lower one-fourth of this kidney was served by an aberrant artery arising lower on the aorta.

At surgery (Fig. 3), Dr. Foley found the main left renal artery closed by a thrombus at the site of an arteriosclerotic plaque, and the upper three-quarters of this kidney was infarcted. A definite line of demarcation separated the infarcted portion from a viable lower quarter of the kidney which was supplied by an aberrant smaller renal artery arising at a lower level of the aorta.

The patient's postoperative blood pressure averaged around 120/80, and on leaving the hospital on October 3, 1956, his blood pressure was 140-150 systolic and 90 diastolic. A month later, his local doctor read the pressure as 120/80.

The man has since had other vascular difficulties, with vascular insufficiency of his internal iliac vessels. On August 27, 1957, he was operated on at the Miller Hospital by Dr. Davitt Felder for a right common iliac obstruction. An aortofemoral arterial by-pass was performed. His blood pressure on that admission was 160/80. On October 18, 1957, he was admitted to the Miller Hospital for aortography. His blood pressure then was 150/90. On January 30, 1958, he was admitted to the hospital again for endarterectomy and sympathectomy for a right common iliac obstruction. His blood pressure on admission was 172/100. Later readings before leaving the hospital were 110/90 and 130/80.

The authors wrote to the patient recently and asked him to have a blood pressure reading by his local doctor. It was 144/82. The patient is able to carry on moderately limited work. His only disability is the circulation to his right lower extremity.

Conclusion

A brief discussion of, and a case report demonstrating hypertension due to unilateral renal disease, have been presented. The criteria for assigning the cause of hypertension to unilateral renal disease are rigid, but the authors think that this case meets these criteria.

References

1. Goldblatt, H. A., et al: Studies on experimental hypertension. Am. J. Exper. Med., 59:347, 1934.
2. Graef, I., and Page, I. H.: The pathological anatomy of cellophane perinephritis. Am. J. Path., 16:211 (March) 1940.
3. Tigerstedt, R., and von Bergman, P. G.: Niere and Kreislauf: Skandinav Arch. f. Physiol., 8:223, 1898.
4. Fasciolo, J. C., Houssay, B. A., and Taquini, A. C.: The blood pressure raising secretion of ischaemic kidney. J. Physiology, 94:281 (Dec.) 1938.
5. Pickering, G. W.: High Blood Pressure. New York: Grune & Stratton, 1955.
6. Wakerlin, G. E.: Antibodies to renin as proof of the pathogenesis of sustained renal hypertension. Circulation, 17:653, 1958.
7. Braasch, W. F., Walters, W., and Hammer, H. J.: Hypertension and surgical kidney. J.A.M.A., 115: 1837 (Nov. 30) 1940.
8. Reiser, M. P., and Creevy, C. D.: Hypertension and unilateral renal disease. Bull. U. Minnesota Hospitals and Minnesota Medical Foundation, 26:507. 1955.

Report of Case

Diverticulitis of the CECUM

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DIVERTICULITIS of the cecum is rare. The true incidence is not known. Reports of acute diverticulitis of the cecum are not common in the literature, and until January 1959, there were about 200 such cases reported. Of 900 operations for colonic diverticulitis at the Mayo Clinic, nine were in the cecal area. It is probably more common than reported, however, because half the cases constituting the report given by Nissenbaum[1] were found by only twenty-two authors. Also, nearly half of the cases of this same series was reported within the last five years.

Cecal diverticulae differ from the generalized form in that they are usually single. They occur in a much younger age group and generally are of the true variety. It is generally accepted that they are congenital.

The diverticulae are approximately 1 cm. in diameter at the osteum and vary from 1 to 3 cm. in length. Most of the cases contain fecaliths which cause the obstruction which is believed to be responsible for the onset of the inflammatory reaction.[2] The acute inflammatory stage, as expected, is characterized by hyperemia, leukocytic infiltration, suppuration, ulceration, and possibly gangrene with adjacent pericecal edema and peritoneal reaction. Subsequently the process may resolve with recurrent low-grade localized infection. On the other hand, the acute processes may proceed to perforation with either localized abscess or a generalized peritonitis resulting. If the condition extends beyond the diverticulum, it involves the adjacent cecum and pericecal tissue, and a large inflamed granulomatous mass with palpable mesenteric lymph nodes, indistinguishable from infected carcinoma confronts the surgeon at laparotomy. The majority of the cecal diverticulae are located close to the iliocecal valve. A cecal diverticulum is rarely, if ever, found in an appendix epiploica, in contra-distinction to those found in the sigmoid colon.

The diagnosis of diverticulitis of the cecum is rarely made prior to operation. The most common diagnosis in almost 100 per cent of the cases being acute appendicitis, and the abdomen is opened with this diagnosis in mind. The symptoms and signs of acute diverticulitis are practically indistinguishable from those of acute appendicitis. Nausea and vomiting seem to be more frequent with appendicitis than with diverticulitis. A right lower quadrant mass was palpable in

about one third of the cases reported. The average age is 39.6; distinctly less than the average age of 53.6 quoted for diverticulitis of the sigmoid colon. The sexes are about equally affected.

In about 65 per cent of the cases it is possible to make a correct diagnosis at laparotomy; in the remaining cases it is impossible to tell if one is dealing with a malignancy or not. Cecotomy has been used and found to be very valuable in making a diagnosis at the time of operation. A flat plate of the abdomen is considered by some to be valuable pre-operatively in making a diagnosis. In some cases, a correct diagnosis was obtained preoperatively, by the use of barium enema. In the cases reported by Inglis[2] two of them were given barium enemas preoperatively, but the diagnosis was not evident because the diverticulae were filled with fecal material. When confronted with a mass at laparotomy, the differential diagnoses to be considered include: carcinoma, tuberculosis, actinomycosis, non-specific granulomas including regional ileitis and the non-specific ulcer; and to these might be added the carcinoid tumor and the subacute foreign body perforations of the cecum.

It is generally agreed that local excision of the lesion is the best form of treatment. Right hemicholectomy was performed in six of sixteen operations in the series reported by Inglis.[2] They considered that major colonic resections could have been avoided if the true nature of the condition had been realized at the time of operation. However, these authors point out that there are circumstances when a major colonic resection is necessary because the diverticulum is so close to the iliocecal valve or the diverticulum is in such a position as to jeopardize the blood supply of the colon. In all cases except those of hemicolectomy, the appendix was removed at the time of the primary treatment of the diverticulum. This did not appear to increase post-operative morbidity and it is recommended that appendectomy accompany the local excision of the diverticulum.

In summary, acute diverticulitis of the cecum, although relatively rare, probably occurs more commonly than standard surgical texts or the surgical literature would suggest. It is generally not possible to distinguish it from acute appendicitis on a clinical basis. At operation, the diagnosis is evident in about 65 per cent of the cases. In the remaining instances, it is concealed in a mass which is usually interpreted as carcinoma. Colotomy is a valuable means of establishing the diagnosis at the time of surgery. Local excision of the lesion and in some cases simple inversion of the diverticulum constitute the treatment of choice. Appendectomy may and should be carried out concurrently if at all feasible. Major colonic resections can usually be avoided if the possibility of diverticulitis of the cecum is considered. Anyone doing appendectomies should be aware of this lesion and know how to deal with it. And, when a laparotomy is performed for a preoperative diagnosis of appendicitis, and a normal appendix is encountered the cecum as well as the gall bladder and the terminal ilium and the pelvic viscera, should be explored carefully.

Case Report

Mr. G. H., aged twenty-seven, white, is married and is a tavern owner. He became ill on May 4, 1959, in the afternoon. He noted pain in the abdomen, on the right side. This pain was steady in character. The pain had started on the right side, and had stayed there throughout his present illness. He was seen in the out-patient department of the Zumbrota Hospital at 9:00 A.M. on May 5, 1959, and found to have tenderness a little above and a little lateral to McBurney's point, and there was a suggestion of a mass. The urine was negative. The white count was 14,850 with 78 neutrophiles, 20 lymphocytes, 1 monocyte, and 1 basophil. The patient was sent to Dr. Sam Hamilton of Red Wing, for consultation. Doctor Hamilton saw him on May 5, 1959, in the early part of the afternoon, and agreed that the most likely diagnosis was appendicitis and that surgery was indicated. He also reported that he could feel a mass. The patient was brought back to the Zumbrota Community Hospital for surgery.

Family History: The father had his stomach removed for a duodenal ulcer. Otherwise there is no history in the family of any unusual intestinal trouble.

Past History: Patient has had no severe illnesses. He has had no previous abdominal surgery. He was injured in an automobile accident in 1951, and his left arm was operated on for fracture of both bones of the forearm.

Physical Examination was as follows: Blood pressure: 118/64; temperature: 100.6 orally; pulse: 94, respirations: 26. The positive findings were confined to the abdomen. There was a suggestion of a mass a little above and a little lateral to McBurney's point. There was marked tenderness and rebound tenderness at this point. Bowel sounds were present.

Preoperative Diagnosis: Acute appendicitis.

The patient was operated on at 4:00 P.M. on May 5, 1959. The usual muscle-splitting incision was made over the point of most tenderness. The appendix appeared to be normal. Immediately adjacent to it within one half inch of the base of the appendix, was a mass measuring about one and one-half inches in diameter.

This mass was hard and indurated, and covered with fibrin. Diverticulae could be seen along the course of the cecum. At one point in the inflammatory mass, after delivering the cecum, fecal material could be seen oozing out. A tentative diagnosis of diverticulitis was made; however, cancer could not be ruled out. The appendix was removed in the usual manner, and it was decided to exteriorize the cecum because of the perforation, and to do a secondary operation later. It was felt that in this manner we could get an assessment of the entire colon and prepare the bowel before we did a definitive operation. The cecum was brought out and the peritoneum was closed around it. The fascia and subcutaneous tissue were closed with catgut sutures. Skin clips were used in the skin. The patient was placed on I.M. penicillin 400,000 unit and dihydrostreptomycin ½ gm. b.i.d. for five days. He was treated with continuous gastric suction for two days, and with intravenous feedings during this time. On May 12, 1959, a barium enema was done, and reported that the mucosal pattern of the cecum was normal, and there was no evidence of any intrinsic mass. There were several diverticulae seen in the cecum and the proximal ascending colon.

During the week after the original surgery, there was some leakage of fecal material from the exteriorized cecum with its mass, some leakage being noted on May 7, 1959, and on May 8, and again on May 12. His general condition became very good a few days after the original surgery and he was able to be up and around. From May 11 until May 13 he was given Neomycin 1 gm. every hour for four doses, and then 1 gm. every four hours, and also given cleansing enemas.

On May 13, 1959, he was again operated on and under general anesthesia the cecostomy was taken down and a right hemicolectomy was done. The main incision was closed in the usual manner without a drain. The cecostomy wound was closed leaving a drain in the wound after the peritoneum was closed. Following the hemicolectomy, he was again put on penicillin-dihydrostreptomycin, b.i.d, for five days. On May 20, 1959, the patient started running a higher temperature, going up to 101.8 in the afternoon. This was occurring after the temperature had apparently settled down near normal. He was examined, and a chest x-ray was taken which showed patches of atelectasis in both bases but otherwise was normal. On May 22, the temperature having stayed up, Tetracycline HCl and Glucosamine 250 mg., four times a day, was started, and the patient began to improve within a day or two. On May 23, 1959, two small areas on the main incision broke open and drained purulent material. This drainage, however, stopped within twenty-four to thirty-six hours, and these areas promptly healed up. They seemed to be superficial small wound abscesses. The fact that the fever went down and the patient felt better after they opened and drained, suggested that they were the cause of his secondary rise in temperature. The sutures and drain were taken out of the cecostomy incision on May 25, and the patient left the hospital on May 27, twenty-two days after his original admission. He has been well since. The pathology report after the first operation was as follows:

"The appendix is 9 cms. long, smooth, and shows no active inflammation." The pathology report following the hemicolectomy was as follows: "The specimen consists of a segment of terminal ilium about 6 cm. long together with a segment of the cecum 9 cm. long. The surfaces, particularly the base of the cecum, are roughened and covered with hemmorhagic partly necrotic exudate. What is probably a short segment of appendix is buried in the indurated fat in one area in the base of the cecum. Microscopic section here shows inflammatory changes and scarring around this structure. There is no evidence to indicate that this process began in the lumen. In the vicinity there are several diverticulae of the cecum. There are extensive inflammatory changes and scarring in relation to these structures. I have not with certainty demonstrated the point of origin of the inflammatory changes, but in all probability it began as a diverticulitis."

Summary

Here is presented a case of acute diverticulitis of the cecum in a young person. It was discovered at the time of laparotomy which was done with the preoperative diagnosis of acute appendicitis. We were not able to be sure of the diagnosis at the time of the first laparotomy. However, the young age of the patient made a carcinoma unlikely. The procedure of exteriorizing the cecum with its mass seemed very reasonable, and seemed to be the safest thing to do at the time. The patient got along very well and had no complications of any serious consequence. In our patient, the diverticulum was not a solitary diverticulum of the cecum, there being about five or six of them present. The rest of the colon did not have a diverticulum or any pathology. The hemicolectomy was done to excise the inflammatory mass and also the other diverticulae present in the area. The young age of the patient suggests that they were congenital in origin.

References

1. Nissenbaum, James, et al: Cecal diverticulum. Am. J. Roentgenol., 73:596, 1955.
2. Inglis, F. G., et al: Solitary diverticulitis of the cecum and ascending colon. Canad. J. Surg., 2:166, 1959.

Applied Anatomy for Ptosis Surgery

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THERE ARE few operations that give more satisfaction to the surgeon than the successful correction of muscular deformities about the eye.

And there are few patients who are more lastingly grateful to their surgeons than those who have had such deformities corrected.

There is something about visible ocular defects that is different. Human nature being what it is, a limp or a brace or a deformed back will evoke silent pity, while a crossed eye or a drooping lid will excite ridicule.

The child whose eyes cross must learn early in life to parry the question, "Who are you looking at, anyway?" and to ignore the greeting, "Hi, Cockeye!" To be called "Droopy" or "Blinky" is all too familiar to the child with a ptosis of the upper lid. These cruel words cut like a knife into the heart of a child. It is important that the conditions which provoke them be corrected before he is old enough to have them endanger his personality.

But it is even more important that their surgical correction, once undertaken, be done well. This is only possible when the surgeon has a thorough, complete, and detailed knowledge of the anatomy involved. This is particularly important in the matter of ptosis of the upper eyelid.

Resection of the levator muscle is the most frequently employed technique for correcting ptosis of the upper eyelid. Provided the operator thoroughly understands the anatomy of the levator muscle and the related fascial planes, this operation is safe, simple, and usually successful.

In conjunction with Dr. Walter Fink, in his work on the oblique muscles, I have recently reviewed and dissected the upper orbital structures.

It is hoped that the following anatomical review will be useful to some of you, as it has been to me, at the operating table.

Notes on Embryology

The four recti muscles, with the obliques, separate out from the mesodermal cone at the two-months, or 20-mm. stage, of embryonic development. The levator appears much later as a small muscle slip separating from the medial border of the superior rectus. At the 75-mm. stage, it overlaps the superior rectus and grows rapidly forward, but does not reach its final position until the fourth or fifth month of fetal life. This late appearance of the levator may account, in part, for some of its congenital weaknesses.

Anatomy of the Levator

The levator palpebrae superioris muscle is the special elevator of the upper eyelid. By contraction of this muscle's belly, the transverse aponeurosis is pulled back over the globe, pulling with it the skin of the lid, the tarsal plate, and the loose conjunctiva of the superior fornix.

It acts in harmony with the superior rectus with which it shares the same nerve supply, though it may act independently. It can also act

in unison with the frontalis muscle, as in expression of amazement. All three muscles act together in looking up.

The levator muscle is thin, flat, and roughly in the shape of an isosceles triangle. It arises by a short tendon from the lesser wing of the sphenoid bone just above the annulus. Its origin blends inferiorly with the superior rectus and medially with the superior oblique. It passes forward close beneath the roof of the orbit, the frontal nerve and the supra-orbital artery lying upon it. From the beginning, the levator lies upon the superior rectus, the medial borders of the two muscles being adherent by a thin fascial sheath.

As the muscle approaches the septum orbitale, it terminates in a smooth glistening expanded aponeurosis. This aponeurosis is shaped like a visor and splays forward to become attached primarily to the skin of the whole of the pre-tarsal part of the lid. The lateral extremities of the aponeurosis remain tendinous and form the two horns which attach to the bone at the lateral and medial orbital margins.

The lateral horn is the stronger, and after cutting into the lacrimal gland, it inserts at the orbital tubercle of the zygomatic bone. The medial horn passes over the tendon of the superior oblique and fuses with the medial palpebral ligament to attach to the lacrimal bone.

The secondary attachments of the levator are to the upper margin of the tarsal plate and to the conjunctiva of the upper fornix. The former is accomplished by the superior palpebrae muscle of Muller, and the latter, by slips of the fascial sheath of the muscle's belly.

Related Fascial Sheaths

The fascial sheath of the levator is thin posteriorly. The anterior part of the sheath, just behind the aponeurosis, becomes thick and spreads transversely across to reach the orbital walls on either side. This horizontally displaced sheath lies above the aponeurosis and is said to be the true check ligament to the levator, preventing its overaction.

The septum orbitale, or tarsal ligament of Winslow, is membranous and quite thick at its origin along the periosteum of the orbital margin. Its fibers pass downward to fuse with aponeurotic fibers and are carried forward with them to attach to the skin of the upper lid. This disposition of septum fibers aids in forming the external palpebral fold when the lid is elevated.

Practical Anatomical Considerations at Time of Surgery

1. One should make a good dissection of the aponeurosis, picking up the glistening white ribbon over as wide an area as possible. The tongue for resection should be at least as wide as the "Berke" ptosis clamp, which is 14 to 15 mm.

2. Be sure to identify the orbital septum. It appears as a thin white fascial wall falling perpendicularly onto the upper part of the aponeurosis.

3. Resect enough of the muscle. It is easy to take 14 mm., or more, and this would rarely be too much.

4. When re-attaching the muscle, space four to six mattress sutures so that the cut end can be spread out to conform to the lid margin from the medial to the lateral extremities, just as the natural aponeurosis splays horizontally.

5. Pass each suture through the orbital septum, being careful to take the bite high and near the periosteal attachment at the upper orbital rim. This copies the natural attachment and gives the lid a well formed palpebral fold.

6. Bring the sutures out low, near the cilia, and spaced across the entire margin of the upper lid. This is the area of the primary and main insertion of the terminal cutaneous fibers of the levator.

7. Try using one of the operations in which the conjunctiva of the upper fornix is shortened and pulled up with the sutures, such as the Iliff operation. One of the secondary points of insertion of the levator sheath is into the conjunctiva.

Summary

1. The gross anatomy of the levator palpebrae superioris is reviewed.

2. Some practical points of the applied anatomy for ptosis surgery are listed.

References

1. Whitnall, S. Ernest: Anatomy of the Human Orbit. p. 142. Oxford Medical Publications, 1932.
2. Fink, H. Walter: Surgery of the Oblique Muscles of the Eye. p. 76. St. Louis: C. V. Mosby Company, 1951.
3. Wolff, Eugene: The Anatomy of the Eye and Orbit, p. 189. New York: McGraw-Hill Company, 1955.
4. Iliff, C. E.: A simplified ptosis operation. Am. J. Ophth., 37:529, 1954.

Cutaneous Manifestations of

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CUTANEOUS changes associated with internal cancer and the malignant lymphomas interest not only dermatologists but also internists, surgeons and other practitioners. Frequently, the cutaneous manifestations of these diseases are typical, both clinically and microscopically. In some cases, however, the cutaneous signs and symptoms are not characteristic, but only suggestive of the underlying internal disorder. Sometimes, they represent the initial symptom noted by the patient. Early recognition and accurate interpretation of these dermal clues will often aid the physician in his search for the internal counterpart.

Since it is obviously impossible to discuss in detail all the cutaneous manifestations of internal malignancy, a brief review of the more common cutaneous findings occurring with these conditions will be given. It has been customary to classify the various skin lesions observed in association with internal neoplastic disease into two groups, specific, and non-specific or toxic. In the specific group, the malignant process involves the skin directly and the lesions represent true neoplastic infiltrations. The non-specific or toxic eruptions may consist of a variety of localized or generalized primary cutaneous lesions including macules, papules, vesicles, bullae, wheals and hemorrhagic lesions. Also localized erythema frequently becoming generalized and associated with scaling is fairly common. This is referred to as exfoliative erythroderma. Excoriations and secondary pigmentary changes are also frequently seen. However, it should be emphasized that the designation non-specific is purely a morphologic one, since specific tumor infiltrates are frequently present in these lesions also and the differentiation thus depends on the microscopic features. In some instances, there is no sharp dividing line between the two types of lesions.

Visceral carcinoma may rarely metastasize to the skin either early or more often, late in the course of the disease. The incidence of cutaneous

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Internal Malignancy

metastases has been reported as being from 1 to 3 per cent.[1] In an autopsy study of 2031 cases of internal cancer,[2] Gates found fifty-eight instances of cutaneous metastases, an incidence of 2.8 per cent. McDonald, Heckel and Kretchmer,[3] in a review of the Chicago Presbyterian Hospital records from 1903-1949, found only thirty-three cases of cutaneous metastases in a series of 11,265 cancer patients. Of these, the primary occurred in the breast in nineteen, rectum five, stomach two, bladder two, and one each in the sigmoid, uterus, ovary, parotid and thyroid. Cutaneous metastases from cancer of the lung, kidney and prostate have been reported by several authors. The metastases reach the skin either by direct extension or by dissemination through the lymphatics or blood stream. The most frequent sites of involvement are the scalp and trunk, although lesions may occur on any part of the skin. The tumors may be single or multiple, firm, discrete nodules of variable size and color. They are usually asymptomatic, and since they have no characteristic clinical appearance, microscopic examination is necessary for a diagnosis. Rosenthal and Lever,[4] in a review of the literature on sixty-nine patients with cutaneous lesions from kidney cancer, found forty-four instances of true metastases, sixteen of extension to the nephrectomy scar and nine had extension to the external genitalia, five of these in the male and four in the female. In fifteen patients, the scalp was the site of metastasis and in 20 per cent the cutaneous lesions were recognized before a diagnosis of the primary kidney tumor was made. Malignant disseminating tumors of the breast rarely produce an erysipelas-like inflammatory skin reaction or an infiltrating plaque-type of carcinoma which usually involves the chest wall (carcinoma en cuirasse). Similar lesions have also been reported with carcinoma of the stomach and carcinoma of the rectum.[5]

Non-specific cutaneous manifestations occurring in association with visceral cancer are variable and quite rare. Usually, they indicate necrosis of the tumor and represent a late feature. The most common cutaneous eruption, according to Bluefarb,[6] consists of pruritic, grouped, papular, urti-

carial and vesicular lesions which are clinically suggestive of dermatitis herpetiformis. Many instances of this type of eruption occurring with internal carcinomas have been reported. The skin eruption usually clears when the tumor is removed. Severe generalized pruritus may often be an early premonitory symptom of internal cancer. Many instances of breast, intra-abdominal and rectal carcinomas have been reported in which pruritus preceded all other symptoms and subsided promptly following removal of the primary tumor, only to reappear when the tumor recurred. Pruritic papular eruptions associated with hyperpigmentation have also been noted. The melanoderma may be due to the itching and trauma of scratching or may indicate adrenal involvement by tumor tissue or by pressure. Another pigmentary disturbance known as malignant acanthosis nigricans occurs in conjunction with highly malignant internal adenocarcinoma, the majority of which (about 92 per cent) are intra-abdominal, usually in the stomach. About 8 per cent of the lesions originate in the breast or lung.[7] In this disorder the cutaneous picture precedes the signs and symptoms of the cancer in about 20 per cent and in some instances this has been by several years.[8] In other cases, the eruption has coincided with, or followed, the appearance of the carcinoma. Briefly, the essential clinical features are diffuse, deeply pigmented, soft, verrucous papules and plaques, symmetrically located, particularly in the body folds such as the axillae, infra-mammary, genito-crural and perianal regions. Sometimes the neck, ante-cubitals, popliteals and even the mucous membranes may be involved. It is important to distinguish this from a benign type of the disorder which is clinically and pathologically similar, but usually appears at birth or in early childhood, reaches its peak at puberty, and then either regresses or remains stationary. This type has also been called the juvenile variety and is not associated with any form of cancer. According to Curth,[9] the incidence of herpes zoster in patients having carcinoma of the stomach, breast, uterus and ovaries is about twice as great as in the general population. This eruption is almost always a late manifestation and is frequently indicative of metastases. Erythematosquamous, exfoliative dermatitis and bullous eruptions have all been observed in association with internal cancer. Spider nevi of the face and trunk have been noted in primary or metastatic liver cancer; however purpuric and hemorrhagic eruptions are apparently rare. The association of dermatomyositis with internal carcinoma has been noted with increasing frequency. About 20 per cent have an associated carcinoma either in the breast, ovary, lung, stomach, gall bladder or kidney.[10] In some, dermatomyositis preceded the cancer and in others the reverse was true. Curtis[11] reported that improvement of the dermatomyositis occurred in six out of eight patients following treatment of the malignancy.

The malignant lymphomas represent a group of neoplastic disorders characterized by the proliferation of cells of the lymphoid and reticulo-endothelial systems and may occur in any body organ, including the skin. Unfortunately, since there is no clear-cut differentiation between these various processes, a great diversity of opinion exists as to their proper classification. However, this paper shall include only those which may be found in the skin, sometimes occurring there before appearing in other body organs. The incidence of cutaneous signs and symptoms in diseases of this group varies in different series. However, the usually accepted average for the entire group is about 40 per cent.[12] Non-specific changes are more common than specific ones.

The incidence of cutaneous symptoms and signs occurring in Hodgkin's disease as reported by several authors, varies from 25 to 50 per cent. In about 10 per cent, these manifestations represent the initial presenting complaint of the patient. Persistent, severe pruritus, sometimes generalized, but often confined to the lower extremities including the soles of the feet, is the most common cutaneous symptom of Hodgkin's disease. Excoriated papular and urticarial lesions, hyperpigmentation, dryness and thickening of the skin are also frequently seen. Exfoliative erythroderma is a fairly common manifestation and sometimes may be the initial symptom. According to Montgomery,[13] herpes zoster occurs more frequently in Hodgkin's disease than in any other type of lymphoma. The lesions of this eruption often disseminate, become generalized, and may contain a specific infiltrate. Specific lesions, such as nodules and infiltrated plaques, rarely occur but, when they do, have a tendency to ulcerate.

Cutaneous involvement occurs in about 25 per cent of all types of lymphosarcoma.[14] Primary cutaneous lesions are rare and metastatic nodules constitute the most frequent finding, accounting for approximately 90 per cent of the specific type

of lesions. They are usually firm, indolent nodules varying in color from red to brown and frequently undergo ulceration. Generalized pruritus, exfoliative dermatitis, herpes zoster and a variety of nondescript cutaneous reactions have also been observed in patients having lymphosarcoma.

Cutaneous lesions are seen in about 40 per cent of patients having the various types of leukemia.[15] Morphologically, the lesions are similar regardless of the variety and type of leukemia. In the acute forms, the lesions tend to be purpuric and hemorrhagic and are often associated with oral ulcerations. Papulo-pustular and pyodermic eruptions are also frequently seen. In the chronic types, specific lesions are more common in lymphatic than myelogenous and in some cases may appear before other evidences of the disease. In most instances, they are metastatic, although sometimes they may be primary in the skin. Clinically, the lesions vary in size from a few millimeters to several centimeters. They are usually firm, discrete and vary from red to bluish-brown in color. In lymphatic leukemia, they have a predilection for the face and the hands, although they may be found on other areas of the body. Ulceration of the lesions often occurs. Sometimes the facial infiltrations are diffuse, producing a leonine appearance. Another, less frequent, cutaneous manifestation is generalized exfoliative erythroderma which, in rare instances, may even be the initial symptom of the disease. Although Beek[16] reported this reaction occurring in 25 per cent of the patients with lymphatic leukemia, most observers have not experienced this high an incidence. Herpes zoster, often generalized, is sometimes seen. The lesions may or may not show specific leukemic infiltrations. In myelogenous leukemia specific tumors are less common. They have a predilection for the trunk and extensor surfaces of the extremities and rarely ulcerate. Prurigo-like maculo-papular lesions, hemorrhagic changes, urticarial and bullous eruptions are some of the non-specific changes which have been observed in the leukemias and severe generalized pruritis may be a prodromal symptom.

Mycosis fungoides is a chronic progressive disease which primarily involves the skin, although other internal organs may be affected. It usually starts with intense generalized pruritus, followed by erythematous and eczematous patches or even generalized exfoliative dermatitis. After a variable period of a few months to several years, the skin lesions become thickened and infiltrated. In the final stage several bluish-red brown tumors develop. These have a tendency to break down and ulcerate. Positive microscopic identification of the disease can only be made in the infiltrative or tumor stages.

Summary

1. A review of the cutaneous manifestations associated with some internal cancers and malignant lymphomas is presented.

2. Both specific and non-specific lesions may occur.

3. The non-specific changes are more common and consist of a variety of localized or generalized primary and secondary skin lesions.

4. The specific types are composed of nodules and infiltrative plaques of tumor tissue.

References

1. Wiener, K.: Skin Manifestations of Internal Disorders. P. 565. St. Louis: C. V. Mosby Co., 1947.
2. Gates, O.: Cutaneous metastases of malignant disease. Am. J. Cancer, 30:718, 1937.
3. McDonald, J. H., Heckel, N. J., and Kretschmer, H. L.: Cutaneous metastases secondary to carcinoma of urinary bladder. Arch. Dermat. & Syph., 61:276, 1950.
4. Rosenthal, A. L., and Lever, W. F.: Involvement of the skin in renal carcinoma. Arch. Dermat., 76: 96, 1957.
5. Harvey, G., and Cochrane, T.: Carcinoma en Ciurasse. Arch. Dermat. & Syph., 62:651, 1950.
6. Bluefarb, S. M.: Non-specific cutaneous manifestations of the leukemia-lymphoma group and internal cancer. Postgrad. Med., 16:6, 1954.
7. Sutton, R. L., Jr.: Diseases of the Skin. Ed. 11, p. 696. St. Louis: C. V. Mosby Co., 1956.
8. Curth, H. O.: Significance of acanthosis nigricans. Arch. Dermat. & Syph., 66:80, 1952.
9. Curth, H. O.: Dermatoses and malignant internal tumors. Arch. Dermat., 71:95, 1955.
10. Brunner, M. J., and Lobraico, R. V., Jr.: Dermatomyositis as an index of malignant neoplasm. Ann. Int. Med., 34:1269, 1951.
11. Curtis, A. C., Blaylock, H. C., and Harrell, E. R., Jr.: Malignant lesions associated with dermatomyositis. J.A.M.A., 150:844, 1952.
12. Epstein, E., and MacEchern, K.: Dermatologic manifestations of the lymphoblastoma-leukemia group. Arch. Int. Med., 60:867, 1937.
13. Ormsby, O. S., and Montgomery, H.: Diseases of the Skin. Ed. 8, p. 925. Philadelphia: Lea & Febiger, 1954.
14. Gall, E. A., and Mallory, T. B.: Malignant lymphoma. Am. J. Path., 18:381, 1942.
15. Costello, M. J., Canizares, O., Montague, M. III, and Buncke, C. M.: Cutaneous manifestations of myelogenous leukemia. Arch. Dermat., 71:605, 1955.
16. Beek, C. H.: Skin manifestations associated with lymphatic leukemia. Dermatologica, 96:350, 1948.

Table 1

Case	Age	Sex	Onset	Vaccination	Clin. Desig.
R.W.	5 yr.	M	8-2-59	0	Bulbar
E.C.	4 yr.	F	8-2-59	0	Bulbar
R.L.D.*	10 mo.	F	8-7-59	0	Paralytic sp.
R.B.*	5 yr.	M	8-12-59	0	Paralytic sp.
F.M.*	4 yr.	F	8-12-59	0	Bulbar
J.K.*	1 yr.	F	8-15-59	2	Bulbar
C.G.*	2 yr.	M	8-15-59	0	Paralytic sp.
D.M.K.	18 yr.	F	8-16-59	2	Paralytic sp.
L.T.	4 mo.	M	8-17-59	0	Suspect
E.V.	15 yr.	F	8-17-59	3	Suspect
K.H.*	18 mo.	M	8-20-59	0	Nonparalytic
L.T.Sr.	25 yr.	M	8-21-59	0	Suspect
R.G.*	6 mo.	F	8-21-59	0	Abortive polio
E.C.*	11 mo.	M	8-24-59	1	Abortive polio
J.C.	4 yr.	F	8-26-59	0	Suspect
R.S.*	6 yr.	M	8-27-59	0	Paralytic sp.
W.S.	1 yr.	M	8-27-59	1	Suspect
M.B.	2 yr.	F	9-2-59	0	Paralytic sp.
R.L.Jr.*	5 mo.	M	9-5-59	1	Abortive polio

*Type 1 poliovirus isolated

POLIOMYELITIS EPIDEMIC on a

THIS REPORT concerns an epidemic of Type I poliomyelitis occurring on a northern Minnesota Indian Reservation. Fourteen confirmed cases of poliomyelitis were diagnosed among the 460 Chippewa residents of the 168 square mile Bois Fort Reservation during August and September, 1959. In five other individuals, polio was strongly suspected but unconfirmed. Type I polio virus was also cultured from the stools of nine other individuals not evidently ill, four in case contacts and five scattered in the community which were also contacts. The epidemiologic survey was performed by a team from the State Department of Health: actual care of the patients was given in several surrounding hospitals.

It was reasoned that this outbreak represented an interesting rural prototype of recent outbreaks (generally urban). It involved: (1) an essentially non-caucasian population, (2) low socio-economic standards, (3) large family size, (4) crowded living conditions, (5) low standards of hygiene, and (6) a low incidence of Salk vaccine coverage.

The people of Bois Fort Reservation, located 300 miles north of Minneapolis-Saint Paul, are

Table 2.
Salk Vaccine Coverage of Residents, Nett Lake, Minnesota, by Age

Age	0	1	2	3	4	Per Cent with any vaccine	Per Cent with 3 or more
Under 1	15	2	1			16.7%	0
1 — 4	34	12	6	3	1	39.3%	7.1%
5 — 9	40	9	5	9		36.5%	14.2%
10 — 14	30	8	7	10		45.5%	18.2%
15 — 19	21	3	7	4	1	41.7%	13.9%
20 — 24	18	4		2	1	28.0%	12.0%
25 — 29	15	1		2		16.7%	11.1%
30 — 39	39	1	1	1		7.1%	2.4%
40 — 49	28					0	0
50 — 59	19					0	0
60 & over	18					0	0
Total	277	40	27	31	3	101	34
	71.3%	10.6%	7.1%	8.2%	8%	26.7%	9.0%

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Minnesota Indian Reservation

isolated by geography as well as social and economic factors. Most of the people live in Nett Lake, a village set in the deep forest of northern Minnesota. The rate of indigence is high. Large families are the rule, and many of the homes are very crowded. Community and personal hygiene are comparatively low. The population is strikingly younger than state average—60.4 per cent are younger than twenty years of age as compared to 35.6 per cent for the whole state. The low Salk vaccine immunization rate is emphasized in Table 2.

A comparison of these vaccination rates with those of Minnesota in general within certain age groups is shown below and illustrates how poorly the reservation was actually covered.

Table 3
Comparison of Salk Vaccination Rates,
Minnesota versus Nett Lake

Age	Any Vaccine		3 or more doses	
	Minnesota	Nett Lake	Minnesota	Nett Lake
0 — 4	82%	34.0%	41%	5.4%
5 — 9	95%	36.5%	50%	14.2%
10 — 14	95%	45.5%	33%	18.2%
15 — 19	86%	41.7%	20%	13.9%

On August 18, 1959, six days after the first case was recognized, and on October 1, 1959, immunization clinics were held at Nett Lake. One hundred and thirty immunizations were given at

the first clinic: 127 to children under twelve, and three to expectant mothers. Seventy-five to 100 individuals over this age group had to be turned away for lack of vaccine which was very scarce at that time. Below is a table showing distribution of the 130 shots given.

106	received the first dose
12	received the second dose
8	received the third dose
4	received the fourth dose
130	— total

(These doses are not included in the figures shown in the above tables.)

At the second clinic 166 shots were given and below is the table showing distribution of these shots.

55	received the first dose
81	received the second dose
13	received the third dose
17	received the fourth dose
166	— total

It is known that a fairly large number of people received shots in the offices of private physicians during this time.

This outbreak is of interest in that the various characteristics seen in recent epidemics are all present, but in an isolated area—rural—rather than the underprivileged sections of a city. It is obvious that a large percentage of the population was infested with the virus, whether ill or not. Of interest is the fact that four of the ten paralytic cases showed paralysis of the seventh cranial nerve, with this being the only paralysis in three of these four cases. All but one of the cases were in children six years old or younger. None of the cases showed any respiratory paralysis and there were no deaths. Two of the paralytic cases had each received two shots of Salk vaccine; two of the non-paralytic and abortive cases had received one shot each. The Nett Lake population in general was very poorly protected. A conclusion one is forced to make is that prior immunization might have controlled this outbreak. Nett Lake has missed out completely on the school immunization "clinics" which are common practice in other communities of the area. This is due in part to its isolation, low economic level, and to the lack of any organized public health authority presently responsible for such a project. The vacancy created by the recent policy changes whereby Bureau of Indian Affairs discontinued giving reservation Indians free medical care was not filled by the county health authorities of the two counties in which Bois Fort Reservation lies. Initiative for obtaining the Salk vaccine fell on the Nett Lakers themselves.

Several years of close and friendly contact with the Nett Lake people, as the contract physician, from 1950 through 1954, showed me that these people needed little urging to avail themselves of such medical necessities as immunizations. During my years of holding once-a-week office hours on the reservation, I found that virtually all of the youngsters were brought in for the then-available shots.

My final conclusion is more sociologic than medical. Because it seems clear that adequate immunization would have prevented this outbreak, I feel that our profession must assume the responsibility for seeing that the vaccine and the whole public are brought together. I do not believe that it is necessary that governmental agencies provide this service. If we private physicians will cheerfully and willingly step into the breech and provide immunizations for a nominal charge at mass clinics, I believe we can strike a real blow for the health of our country and for ourselves too, in less government regulation and more public good will. Over the years I have held many immunization clinics (for adults and children alike) in the rural villages of our area, and have found an overwhelming acceptance by the people and a much higher rate of immunization than otherwise possible.

Summary

This discussion has centered about fourteen cases of polio Type I occuring on a small Indian reservation in Northern Minnesota, tracing out the striking resemblance to the recent urban outbreaks. I have suggested that the epidemic probably might have been prevented with prior adequate immunization, and have concluded with an urgent plea to my colleagues to participate freely in immunization "clinics" for adults and children alike—and especially in the underprivileged areas where the need is the greatest.

Report of Case

Relapses of Porphyria induced by Chloroquine (Aralen) Phosphate

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FOLLOWING Page's 1951 rediscovery of quinacrine (Atabrine) hydrochloride's effectiveness in chronic discoid lupus erythematosus,[1] wide use was made of this drug for that disorder. Understandably, the light sensitivities were soon included. Atabrine was eventually replaced by chloroquine (Aralen) phosphate,[2] another antimalarial, which, aside from being less toxic, had the added advantage of not producing the objectionable yellowing of the skin so characteristic of Atabrine ingestion. Clinicians soon began to employ chloroquine empirically for a variety of conditions. A recent review of the literature has disclosed reports on the use of this drug in such divergent disorders as malaria, all forms of lupus erythematosus, light sensitivity, rheumatoid arthritis, amebiasis, tape worm infestation, scleroderma, creeping eruption, neurodermatitis, vitiligo, pemphigus, rosacea, porphyria, acrodermatitis chronica atrophicans, lichen planus, verrucae, granuloma annulare, and recalcitrant vesiculo-pustular eruption of the palms and soles. It is obvious that this drug, alone or combined with other antimalarials (Triquin), is being used extensively for various specific and nonspecific "antiphlogistic" effects.

The incidence of side effects from chloroquine is moderate.[3] Toxic manifestations, however, are usually not of a serious nature and are ordinarily corrected by discontinuing the drug. The more commonly reported ill effects include pruritus, nausea, anorexia, diarrhea, headache, difficulty in visual accommodation—apparently due to corneal epithelial changes, weight loss, and depigmentation of the scalp hair. Less frequent ill-effects include electrocardiographic changes characterized by T-wave depression, leukopenia, lymphedema of forearms and hands, methemoglobinemia, lichenoid dermatitis, exfoliative dermatitis, alopecia, and abnormal pigmentation. Pre-existing psoriasis may be precipitated into an exfoliative erythroderma by this drug.

Porphyria occurring during chloroquine therapy has been reported in three previous papers.[4-6] The scarcity of such reports indicates that this is an unusual and infrequent complication. However, in view of the current widespread use of this drug, clinicians should be advised of this phenomenon.

Report of Case

A forty-five-year-old carpenter, employed at a slaughter house, was first seen in August 1954 with a facial eruption of six years' duration. Dark red, indurated, scaly plaques with some atrophy and associated hypo- and hyperpigmentation were present anterior to and below each ear. Clinically, the eruption appeared to be chronic discoid lupus erythematosus. A biopsy done at this time was reported as showing the classical features of chronic discoid lupus erythematosus. Coincidentally the patient complained of an eruption on the dorsum of the right hand of two and one-half months' duration. This appeared to be simple pyoderma. Blisters reportedly developed on the hand as a result of spark burns from a welding torch. However, in view of his subsequent history, these lesions may have been a manifestation of porphyria cutanea tarda. The patient was given Atabrine which he took somewhat irregularly. Within one month the lesions were less infiltrated, but improvement was not marked.

The patient was not seen again until he was admitted to the medical service of Dr. A. C. Fortney in May 1956. Three weeks prior to admission he developed anorexia and vomiting. These complaints persisted until several days prior to admission when he developed chills and profuse sweating. He reported that his urine seemed dark while his stools were of normal color. The patient appeared toxic but physical findings, except for the chronic discoid lupus erythematosus of the face, were essentially normal. The Watson test[7] revealed the presence of excessive porphyrins in the urine, the final extracts glowing with bright red fluorescence under the

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Wood's lamp. Unfortunately, facilities for quantitative porphyrin determinations were not available. To complicate the problem, hemolytic staphylococci were reported in blood cultures, and the Brucella agglutinin titre was reported as 4+ at 1:1200, 1+ at 1:1600 and negative at 1:3200. One week later these titres were reported as 3+ at 1:1600 and 1+ at 1:3200. This incredible combination of illnesses, associated with an irregular febrile course and with a normal leukocyte count, finally yielded to supportive therapy, erythromycin, aureomycin, and chloromycetin. During this admission it was learned that the patient drank beer every day.

On August 13, 1956, apparently feeling well and with no clinical signs of his recent acute illnesses, this patient returned to the Dermatology Department stating that the plaques of discoid lupus erythematosus on the face were being irritated by the summer sun. A sun-shielding cream was prescribed, and the patient started on chloroquine in dosage of 250 mg. twice daily.

Five days later (August 18, 1956), the patient was admitted to the medical service of Dr. A. C. Fortney complaining of extreme weakness, hematemesis, left-chest pain, and nonproductive cough. He was listless and lethargic. These symptoms had appeared three days prior to admission or two days after initiating chloroquine therapy. The patient stated that he was unable to "catch his breath" since starting chloroquine. His temperature was 102° F. on admission. At this time the Watson test again was positive for excessive urinary porphyrins. A chest x-ray was negative. The leukocyte count was 8,200. This attack subsided uneventfully, and the patient was discharged from the hospital after a five-day stay.

On February 10, 1957, the patient was admitted to the hospital on the medical service of Dr. P. O. Triggs. At this time he complained of pain in the left chest, chilly sensations, sore throat, and dark red urine. He was very irritable. Moist râles were detected at the right lung base posteriorly. A roentgenogram of the thorax revealed pneumonitis in the medial aspect of the right lower lobe. Throat culture revealed alpha streptococci. Again the Watson test for urinary porphyrins was reported as positive. Admission temperature was 103° F. The leukocyte count was 17,400. The patient responded rapidly to a combination of novobiocin and penicillin and was discharged after a six-day hospital stay.

On May 18, 1958 the patient was admitted to the medical service of Dr. P. O. Triggs with a complaint of chills, sore throat and right sided chest pain of two days' duration. His temperature was normal at the time of admission and remained so during a seven-day hospital stay. The Watson test on May 20, 1958 was again reported as positive. A thoracic roentgenogram revealed a small zone of fibrosis at the right lung base, representing possibly a residual of the previous pneumonia or current pneumonitis. The leukocyte count was 10,150. Within four hours after receiving penicillin intramuscularly, an allergic reaction developed consisting of generalized urticaria and severe pruritus. Penicillinase (Neutrapen) was given intramuscularly, and the eruption disappeared within two days. At the time of this admission it was noted that the eruption on the face remained unchanged. Since the patient had not had any specific therapy for his facial eruption in recent years, it was decided at the time of discharge (May 24, 1958) to restart chloroquine at a dosage of 250 mg. daily.

Within five days (on May 29, 1958) the patient was re-admitted to the hospital with complaints of weakness, vomiting, and dark red urine of two days' duration. The laboratory again reported excessive porphyrins in the urine. The leukocyte count was 5,700. The patient followed an afebrile course and was discharged after seven days.

On October 12, 1959, the patient was admitted to the hospital in an intoxicated condition with a complaint of lower back pain. It was not determined whether he had fallen and hurt his back or whether he had suffered back strain as a result of lifting. He had been drinking rather heavily recently. His urine has been red intermittently since his last admission.

Discussion

This patient was hospitalized on six occasions over a three and one-half year period. On each admission, a diagnosis of porphyria alone or associated with other illness was made. Two of these relapses of porphyria occurred within two to three days after starting chloroquine therapy for chronic discoid lupus erythematosus. While admittedly an instance of labile porphyria, attacks being precipitated by a variety of illnesses and probably by alcohol, it was difficult to escape the conclusion that chloroquine was the precipitating agent in these two relapses. The patient supported this clinical impression by independently announcing his refusal to take this medication again, exclaiming, "those pills throw me for a loop."

Summary

A case of porphyria is reported in which chloroquine (Aralen) phosphate was incriminated as precipitating several relapses of the disease.

References

1. Page, F.: Treatment of lupus erythematosus with Mepacrine. Lancet, 2:755 (Oct. 27) 1951.
2. Board for co-ordination of malarial studies: activity of a new antimalarial agent. Chloroquine (SN 7618). J.A.M.A., 130:1069, 1946.
3. Council on Drugs: Additional uses of Chloroquine (Aralen) phosphate. J.A.M.A., 171:1504, 1959.
4. Linden, I. H., Steffen, C. G., Newcomer, V. D., and Chapman, M.: Development of porphyria during chloroquine therapy for chronic discoid lupus erythematosus. California Med., 81:235 (Sept.) 1954.
5. Davis, M. J., and Vander Ploeg, D. E.: Acute porphyria and coproporphyrinuria following chloroquine. A.M.A. Dermat., 75:796 (June) 1957.
6. Marsden, C. W.: Porphyria during chloroquine therapy. Brit. J. Dermat., 71:219 (June) 1959.
7. Todd, J. B., Sanford, A. H., and Wells, B. B.: Clinical Diagnosis by Laboratory Methods. 12th edition, p. 102. Philadelphia: W. B. Saunders Co., 1953.

Special Article

CORONARY ANATOMY

for the Practicing Internist

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THE BASIC SCIENCES of medicine are the foundation of clinical practice. Tempered with careful observation, the wisdom of experience, and the art of dealing with human beings as patients, the basic sciences become applied knowledge and as such perpetually more fascinating. Without them, the art of practice relentlessly regresses to opinionation not based on fact, and ultimately to chicanery.

Cardiology, long one of the major fields of internal medicine, has been made increasingly important by the development of newer and more successful methods of therapy, but also by the rising incidence of coronary disease, for which present therapy leaves much to be desired. One of the basic sciences capable of contributing much to our understanding, and thereby improved treatment, of diseases of the heart is anatomy. To illustrate this point, some observations on the anatomy of the coronary arteries, the crown of the heart, are herewith presented.

If knowledge of the exact location of a coronary occlusion is not important, then an enormous amount of present effort for the production of roentgenograms of the coronary arteries is being misdirected. It is of course important, but not all the reasons are fully appreciated.

An acute coronary occlusion is not, like Gertrude Stein's rose, just an acute coronary occlusion. It behaves differently depending on where the sub-

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sequent myocardial infarction occurs. Consideration of just a few simple points of human coronary anatomy can help explain this difference in behavior. Although many myocardial infarctions (perhaps the majority) are streaky or lamellar or diffuse,[1] enough of them involve specific localized areas to warrant their consideration.

Of these discrete infarcts, there are three groups, each of which is due to occlusion of one of the three main coronary arteries:

1. Anteroseptal infarcts are due to occlusion of the left anterior descending coronary artery.

2. High lateral infarcts are usually due to occlusion of the left circumflex artery.

3. Posterior infarcts are due to right coronary artery occlusion.

Mixed infarcts are better understood if the three basic infarcts above are remembered.

1. *Anteroseptal infarcts* are the commonest of these three. The primary electrocardiographic changes are in leads I, aVL, and V2 to V4. Other factors being equal, more proximal occlusions of the left anterior descending artery produce larger infarcts. Blood supply via anastomoses comes from three directions[2,3]: (1) through the interventricular septum and around the apex from the posterior descending coronary artery, (2) across the free wall of the left ventricle from the left circumflex artery, (3) across the free wall of the right ventricle from the right coronary artery. These same collateral routes apply conversely in occlusion of the other two main coronary arteries. Although the perfusion pressure delivered to the coronary arteries is the major physiologic determinant of flow through coronary anastomoses,[4] patency of the main coronary arteries obviously helps determine this.

For practical purposes, myocardial infarction is left ventricular infarction, the septum being considered part of the left ventricle. Since the left anterior descending artery supplies more of this area, its occlusion produces larger infarcts. As far as the loss of ventricular mass contributes to it, congestive failure is thus more often a problem of anteroseptal infarction. For the same reason, ventricular aneurysm and cardiac rupture following the occlusion of a single artery are more to be anticipated following left anterior descending artery occlusion. Aneurysm, rupture, and congestive failure are all commoner with occlusion of two or more arteries, however.

Ventricular arrhythmias are as apt to occur with left anterior descending artery occlusion as with left circumflex occlusion; as a consequence of heart block they are commoner with posterior infarcts, as will be discussed later. Supraventricular arrhythmias and AV block are rare with isolated occlusion of the left anterior descending artery, since it virtually never supplies the SA or AV nodes or upper conduction system.

Sudden occlusion of the main left coronary artery is seldom a therapeutic clinical problem, most patients failing to survive its abrupt closure. Isolated reports of survival after main left coronary occlusion—or even complete occlusion of both right and left main coronary arteries—are cases of gradual occlusion with remarkable development of collateral circulation.

2. *Lateral infarcts* involve the obtuse margin of the left ventricle, usually more toward the base than apex of the heart. Electrocardiographically the primary changes are in leads I, aVL, and HV3 to HV5 (high leads); the conventional precordial V leads are conspicuously normal or show only the edge of the infarct. These infarcts in 90 per cent of cases are due to occlusion of the left circumflex coronary artery. The point of occlusion is most likely to be in the proximal third of the artery, for occlusion more distally (the other arteries being patent) can be compensated for with high efficiency by collateral flow.

Blood supply of the human SA node comes from the left coronary in about 45 per cent of cases and from the right coronary artery in the remaining 55 per cent; it is virtually always unilaterally derived.[5] In its origin from the left the sinus node artery arises within one centimeter proximal or distal to the bifurcation of the main left coronary artery; the distal origin is always from the left circumflex, not the left anterior descending artery. If the origin is proximal to the bifurcation, which is uncommon, an occlusion of the main artery proximal to it is seldom a problem in clinical management, since it is usually immediately fatal.

Occlusion of the left circumflex artery proximal to the origin of the sinus node artery usually is associated with atrial fibrillation,[6] which is of great localizing value. Thus if atrial fibrillation occurs during an acute lateral myocardial infarction, the point of occlusion is almost certainly in the first centimeter of the left circumflex artery. Prognostically this is grave, for any proximal propaga-

tion of the thrombus may occlude the main left coronary artery. It was empirically observed long ago that atrial fibrillation was a grave prognostic sign in lateral infarcts,[7] though the explanation was unsatisfactory.

3. *Posterior infarcts* are the most interesting from the standpoint of coronary anatomy. Since 90 per cent of humans supply the crux of the heart (where most "pure" posterior infarcts occur) via the right coronary artery, it follows that 90 per cent of these infarcts will be due to right coronary occlusion. Primary electrocardiographic changes occur in leads III, aVF and V8. A prediction with 90 per cent accuracy is about as good as the Wassermann test. It makes one hesitate about coronary arteriography in these particular cases.

One can even improve on the 90 per cent accuracy, however. Ten per cent of humans (15 per cent of men and 5 per cent of women) supply the crux of the heart via the left circumflex artery. If posterior infarction in these cases is due to occlusion of the left circumflex artery, it is usually associated with lateral infarction and there will be primary electrocardiographic changes not only in III, aVF and V8, but also in HV3 to HV6, aVL and V6. Occlusion of the distal left circumflex artery in this 10 per cent variation is unlikely to produce infarction, for collaterals from the right coronary and proximal two-thirds of the left circumflex can be very efficient.

Posterior infarction of the heart involves the primary blood supply of the AV node, for the AV node artery arises from the main coronary artery that crosses the crux.[2,3] This is the reason AV block and Stokes-Adams seizures are associated most commonly with posterior infarcts.[8,9] Syncope at one time or another is a common feature of the history of patients with posterior infarcts, and the onset of the infarction itself may be marked by loss of consciousness or even a convulsion. With frequent recording of electrocardiograms some degree of AV block can be detected in the majority of posterior infarcts, although this may not appear until the third or fifth post-infarction day.[6]

Because AV conduction in posterior infarcts may be expected to be impaired, drugs which depress cardiac conduction (such as quinidine) should be used with appropriate caution. Similarly, in the management of patients with posterior infarcts it is well being forewarned to be forearmed with means of coping with sudden complete heart block. An unexplained manifestation of some acute posterior infarcts is an intense sinus bradycardia.[6] It is my impression that this is a manifestation of intense vagotonia, and that vomiting, diaphoresis, tenesmus, and even sialorrhea are commonly encountered in patients with posterior infarcts. Why vagotonia should be commoner with posterior infarcts is conjectural.

Not only can one presume occlusion of the right coronary artery in posterior infarction with better than 90 per cent accuracy provided there is no lateral infarction present, just as in lateral infarcts the onset of atrial fibrillation is of additional localizing value. It will be recalled that the sinus node artery arises from the right coronary artery in about 55 per cent of humans. The point of origin is virtually always from the first two to three centimeters. Thus if a patient with a posterior infarct develops atrial fibrillation, not only can you be quite certain the right coronary artery is the one occluded, you can also know the occlusion is proximal to the sinus node artery which must arise from that side. The exact point of occlusion can thus be localized in the first two centimeters of the right coronary artery.

Admittedly this oversimplifies the anatomy of coronary occlusion, for more often than not, more than one artery is involved. An understanding of the anatomy of simple coronary occlusion, however, not only assists in planning clinical therapy and prognosis of these particular patients, but also will lead us to a more rational study and final unraveling of the more complex cases.

References

1. Snow, P. J. D.: Coronary occlusion and myocardial infarction. Am. Heart J., 58:645-647, 1959.
2. James, T. N. and Burch, G. E.: Blood supply of the human interventricular septum. Circulation, 17:391-396, 1958.
3. James, T. N.: The arteries of the free ventricular walls in man. Anat. Rec. (in press).
4. Kattus, A. A. and Gregg, D. E.: Some determinants of coronary collateral blood flow in the open-chest dog. Circulation Res., 7:628-642, 1959.
5. James, T. N. and Burch, G. E.: The atrial coronary arteries in man. Circulation, 17:90-98. 1958.
6. James T. N.: Unpublished observations.
7. Wood, F. C., Wolferth, C. C. and Bellet, S.: Infarction of the lateral wall of the left ventricle: electrocardiographic characteristics. Am. Heart J., 16:387-410, 1938.
8. Ball, D.: The occurrence of heart-block in coronary artery thrombosis. Am. Heart J., 8:327-342, 1932-33.
9. Schwartz, S. P.: Auriculoventricular dissociation and the Adams-Stokes syndrome in acute coronary vessel closure. Am. Heart J., 11:554-571, 1936.

Medicine and its Practitioners in Mower County Prior to 1900

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Lyman Drake Jackson (1851-1892), eldest son of Deacon L. A. Jackson and Emily Drake Jackson, was born on January 31, 1851, in Milton, Chittenden County, Vermont. He received his early education in the schools of Milton and at the Lamoille County Grammar School, in Johnson, Vermont. From childhood, he planned to be a physician, but circumstances prevented his study of medicine until, at the age of twenty-two years, he came west to Lime Springs, Iowa. There he was employed in, or operated, a drugstore and read medicine with Dr. John W. Reed, formerly of Alburgh, Vermont. In 1877 Dr. Jackson was graduated from Rush Medical College, Chicago. In that year he began the practice of medicine in Dexter, Mower County, and in 1879 settled in Grand Meadow, where he was in active practice for thirteen years, until shortly before his death, at the age of forty-one.

In 1880, Dr. Jackson was married to Cornelia D. Paddock, of Grand Meadow, a native of Alabama. Dr. and Mrs. Jackson had one child, Edith E., born in Grand Meadow in 1881. They were members of the Congregational Church.

Dr. Jackson was admitted to membership in the Minnesota State Medical Society in 1880. In that year also he was an organizer of the Southern Minnesota Medical Society, the first medical group to be organized in Mower County. Under the "Diploma Law" of 1883 he received certificate No. 148 (R), dated October 13, 1883. In the early eighties he helped to organize a board of health in Grand Meadow, and he served from time to time as a county physician. He has been remembered as "a radical Republican," and as a member of the local Masonic Lodge.

On October 22, 1892 (year indicated in the *Transactions* of the state medical society), Dr. Jackson died, in Grand Meadow, from paralysis with which he had been stricken twelve days earlier. He was survived by his wife, his daughter, his father, who was visiting in Grand Meadow at the time, and by other members of the family in the East. Burial was in the family lot in the beautiful cemetery at Milton, Vermont.

At the time of his death, it was written of Dr. Jackson in a newspaper of Mower County, "The doctor has been a tireless worker and a good physician, being known as such throughout the entire country near here."

Samuel M. Jenks, said by some compilers of early history in Mower County to have been a native of New York, was a graduate of Rush Medical College who came to Grand Meadow in 1872, the year of his graduation, the first physician in the village. He was "a well-educated, successful physician." In the Andreas illustrated atlas of Minnesota, of 1874, there is the following entry: "Grand Meadow Township. Samuel M. Jenks, physician and surgeon. Born in Sandusy City, Ohio, came to Minnesota in 1868. Post Office Grand Meadow." For a year or two in 1876-1878 Dr. Jenks took a Dr. Wilder (*q.v.*) into partnership, in practice and in his drugstore.

In 1880, Dr. Jenks removed to Madison, Lake County, Dakota Territory, from which place he duly was registered as a physician (R) under the Dakota medical practice law of 1885. It is said that he died there about 1925.

Charles Harcourt Johnson (1859-1917) practiced medicine in Austin thirty-three years, from 1884 until his death.

Born on January 15, 1859, at a farm home near Farmersville, Leeds County, Ontario, Canada, he was the son of Mr. and Mrs. Samuel Johnson. He studied at the Almonte Collegiate Institute, Almonte, Ontario, and in March, 1884, was graduated in medicine from McGill University, Montreal. In June of that year he began the practice of medicine in Austin, Minnesota. For a time he was in partnership with Dr. Alexander MacDonald (1856-1947), a graduate of McGill in 1883, who had arrived in Austin in that year. Dr. Johnson was licensed in Minnesota on August 18, 1884, receiving certificate No. 939 (R).

Dr. C. H. Johnson was a brother of Dr. J. Ross Johnson (1855-1905), a graduate of McGill University in 1883, who from that year until his death practiced in Spring Valley, Fillmore County; and a half brother of Dr. William Nassau Kendrick (1872-1936), a graduate of McGill in 1896, who practiced with Dr. J. Ross Johnson in Spring Valley from 1896 to 1898, and from the latter year to 1905 with Dr. C. H. Johnson in Austin. In 1905 Dr. Kendrick returned to Spring Valley.

In Austin, Dr. Charles H. Johnson served six terms as mayor of the city, during which he brought about many improvements, including a sewer system, electric lighting, a viaduct, new fire-fighting apparatus, and extension of public utilities. He was several times a county physician, was an examiner for the United States Bureau of Pensions, and was surgeon for the Chicago, Milwaukee and St. Paul Railway Company. He was an early member of the Mower County Medical Society and automatically a member of the Minnesota State Medical Association.

Dr. Johnson was a member of the Episcopal Church, a Democrat, a member of various fraternal organizations, among them the Masonic Lodge, Modern Woodmen of America, Ancient Order of United Workmen, Knights of Pythias, Order of Eagles and Order of Owls. He is remembered as a genial man, well liked, liberal and charitable, a faithful civic servant, and an ethical and skillful physician.

A nephew of Dr. Johnson was the late Dr. Charles Harcourt Johnson of Spring Valley, son of Dr. J. Ross Johnson.

Frank M. Johnson was in southern Minnesota as a general practitioner of medicine and surgery from 1883 into 1896, for seven years in Mower County.

Born at Fort Atkinson, Jefferson County, Wisconsin, on August 29, 1854, Frank M. Johnson when a child removed with his parents to Vernon County, Wisconsin, and there grew up. He attended the high school at Viroqua, took an academic course at Wayland Academy in 1876, and in the three years immediately following studied medicine with Dr. William Gott of Viroqua. Soon afterward he enrolled at Rush Medical College, from which he was graduated in 1882. The scene of his first practice, for a year and a half, was Ontario, Vernon County, Wisconsin. He was married there to Ida De Lapp, a native of the village, born on December 2, 1860.

In September, 1883, Dr. and Mrs. Johnson and their infant son, Lee F. Johnson, settled in Brownsdale, Mower County, Minnesota. Dr. Johnson was licensed in the state on December 31, 1883, receiving certificate No. 958 (R); he was listed as living in Grand Meadow. It appears, however, that he remained in Brownsdale for two or three years before removing to Grand Meadow; in Grand Meadow he practiced medicine and ran a drugstore until January, 1890, when he went to Byron, Olmsted County. Dr. Johnson was a Baptist and a Prohibitionist; in 1890, in Olmsted County, he was nominated as coroner by the Prohibition Party.

Early in 1892, Dr. Johnson went with his family from Byron to Dover; in this period he took a graduate course in medicine in Chicago. He early became a member of the Southern Minnesota Medical Association (1892). In May, 1896, Dr. and Mrs. Johnson and their three children removed to Springfield, Missouri, where they remained until 1931 (according to the AMA directory).

L. D. Johnson has been mentioned as having been in Dexter, and in Grand Meadow, in 1884. Information about him has not been available. It seems probable that the name may have been confused with that of Dr. L. D. Jackson.

J. C. Jones, believed to have been the first physician to practice medicine in Mower County, in the spring of 1855 came to Le Roy Township accompanied by his wife, and "settled on the Joe Mason farm." Dr. Jones and his wife were both practitioners of the Thomsonian school. They followed their profession in the

locality of Le Roy until Dr. G. M. Allsdurff came to the village in 1864, after which they are said to have retired from practice. In 1868 they went to Missouri to engage in farming, an occupation in which they were continuing in 1884.

W. C. Jones came to Austin in 1862 and engaged in a limited practice. On his professional card he announced that he had had thirty years' experience in the practice of medicine and surgery. He died in Austin about 1879.

More is known about B. F. Jones, son of Dr. W. C. Jones, than about the father. In 1860, B. F. Jones began publication in Austin of the *Minnesota Courier;* he was assisted in the enterprise by the directors of what was then the McGregor and Mankato Railroad Company (later the Iowa division of the Chicago, Milwaukee and St. Paul Railway Company). The purpose of the newspaper was to attract settlers to Austin and thus make the city a central point. In January, 1861, Mr. Jones entered the Union Army. Further record does not appear until August 26, 1874, when the first issue of the *Independent,* of Austin, was printed, with B. F. Jones as editor.

L. Joslin, according to notes by Armstrong, "located in Austin in 1898 and was at that time the only physician in town who owned an ophthalmometer." Dr. Lester Joslin, a graduate of the Medical Department of Western Reserve University in 1867, was listed from 1886 to 1900, inclusive, as in Ionia, Michigan. He may have been briefly in Austin, Minnesota.

Emma Adeline Keeney opened an office in Austin probably in 1898. Born in 1876, she was graduated in 1897 from the College of Homoeopathic Medicine and Surgery of the University of Minnesota. In April, 1898, she was licensed to practice in Minnesota. There is evidence that she began her professional career in Spring Valley, Fillmore County, and practiced there for possibly a year; in a business directory of 1898-1899 listed the name of "Mrs. E. A. Keeney" as a physician.

From Spring Valley Dr. Keeney moved to Austin, where for a time she was in partnership with Dr. Fannie G. Kimball Fiester. After a few years Dr. Keeney took graduate work, and in 1904 was graduated from the Hering Medical College of Chicago. Presumably she settled soon afterward in Albert Lea, Freeborn County, where she was practicing in 1907. In 1909 she was licensed to practice in the state of Oregon, and into 1914, after which record did not appear, she was in active practice in The Dalles, Oregon.

William Nassau Kendrick was born at Athens, Leeds County, Ontario, Canada, the son of Samuel Kendrick and Amelia McNish Kendrick, both of English parentage and natives of Oak Leaf, Ontario.

William N. Kendrick went to school in Athens, and subsequently was a student at the Almonte Collegiate Institute, at Almonte, Canada, from which he was graduated with honors in 1890, at the age of seventeen. Two years later, having decided to become a physician (like his half brothers, who were then in Minnesota: Dr. J. Ross Johnson, Spring Valley, and Dr. Charles Harcourt Johnson, Austin), he entered McGill University, from which he was graduated in medicine in 1896, again an honor student and the president of his class, with the degrees of M.D. and C.M.; among the awards for scholarship which he had received during his course of four years were the Primary Prize, the Prize for General Proficiency, and the Gold Medal for Proficiency in Chemistry.

Immediately after graduation, Dr. Kendrick came to Spring Valley, Fillmore County, to join Dr. J. Ross Johnson in practice. On June 9, 1896, he was licensed as a physician in Minnesota. In Spring Valley, on October 14, 1896, he was married to Maude M. Lloyd, daughter of Mr. and Mrs. L. M. Lloyd of that place.

In 1898 Dr. Kendrick joined Dr. Charles H. Johnson, who was in ill health, in practice in Austin, where he remained eight years. During these years there were born to Dr. and Mrs. Kendrick two children, Dorothy Gertrude and William Lloyd.

In 1905, after the death of Dr. J. Ross Johnson, Dr. Kendrick returned with his family to Spring Valley, where he spent the remaining thirty-one years of his life, a loved physician, high in the esteem and confidence of his patients and fellow townsmen. (See sketch of Dr. Kendrick in medical history of Fillmore County.)

— **Kimball,** mentioned as being in Austin, Mower County, in the nineties, was Dr. Fannie Gray Kimball (Fiester).

E. J. Kingsbury, who became a well-known citizen and medical practitioner of medicine in southern Minnesota, was a native of New York, born in Franklin County August 23, 1832. When he was four years old, the family moved to St. Lawrence County, New York, where he grew up. He obtained his preliminary and academic education at the district school in Potsdam, at a select school in Raymondville, and during six years at the Raymondville Academy under Professor Montague. Thus prepared, at the age of eighteen he began to study medicine under preceptors —the first, Dr. Herman A. Boland, of Raymondville, and the second, Dr. Goodrich, of Potsdam. He completed his medical training by attending lectures at the American Medical Institute at Cincinnati, from which institution he was graduated on March 14, 1854. Beginning his medical practice in Oswego County, New York, he remained there until the autumn of 1855, when he came to Minnesota Territory and settled in Mower County. Here, he pre-empted the southwest quarter section 20, town 102, range 14, in the present Bennington Township, and in due time assisted in the organization of the township and served as first chairman of the first board of supervisors. He may have practiced medicine at this time. After a few years he removed, in the autumn of 1860, to Spring Valley, Fillmore County, where he was in active medical practice for eight years. During this period, the county records occasionally mentioned his receiving fees for medical attendance on paupers.

In Spring Valley, he was for a time in partnership with his brother, Dr. W. B. Kingsbury (about whom no other information has appeared) in the practice of medicine and surgery, and further, as set forth in a professional card:

> E. J. Kingsbury, having been appointed Examining Pension Surgeon by the Commissioner of Pensions, will attend to all applications for pensions with promptness and dispatch. They will also attend to the collection of back pay and Bounty.
>
> E. J. Kingsbury
> W. B. Kingsbury

Late in 1868, Dr. E. J. Kingsbury went to Decorah, Iowa, where he remained until 1870, when he again settled in Mower County, in Le Roy, which became his permanent home. His arrival in Le Roy coincided with an outbreak of diphtheria during which he served faithfully, winning the confidence of the community.

E. J. Kingsbury was married twice, the first time on July 3, 1853, to Lucia A. Angell, who was born at Pomfret, Vermont, on April 8, 1829. Mrs. Kingsbury died in Spring Valley on September 28, 1867, leaving one child, Flora A.; an infant son had died a year earlier. Dr. Kingsbury was married on October 21, 1868, to Mary G. Hard, who was born in Broome County, New York, on September 21, 1846. Of this marriage, there were three children, Mattie J., Mildred A., and Elmer J.

A strong advocate of temperance, E. J. Kingsbury from the age of seventeen years was a member of one temperance organization or another. That he was a man of active intellect and professional versatility was evidenced by the fact that he studied law as well as medicine and became a qualified member of the bar of Minnesota, admitted on April 6, 1882, to practice law in all courts in the state. In 1884 he had been serving for four years as police justice of Le Roy.

Dr. Kingsbury is said to have died in 1885, at the age of fifty-one years.

Henry L. Knight was graduated from Rush Medical College in 1856. He arrived in Le Roy, Mower County, in 1884, where he became the outstanding physician, especially in the early nineties. In 1888 and again in 1895 he took graduate work at Rush Medical College, and in 1896 studied at the University of Bonn, Germany. In 1895 he sold his practice to Dr. Milan J. Hart with the intention of practicing in Adams. The exact sequence of his travels is not clear, but evidently he was in Adams for a time "before leaving for the Klondike." He again returned to Adams and practiced there until probably 1903, when he removed to California.

Dr. Knight was licensed in Minnesota on September 18, 1884, receiving certificate No. 961 (R). He was admitted to the Minnesota State Medical Society in 1886. An early member of the Mower County Medical Society, he was listed in 1903, in a roster of the county society that appeared in the *Transactions* of the state society, as in Adams.

David Kyts (sometimes seen Kyto), a "thorough graduate" of the Physio-Medical College of Indianapolis, Indiana, came to Brownsdale in the summer of 1883. After a few weeks, perhaps months, he left for Michigan. There seems no

doubt that he was the Dr. David V. Kyts, a graduate of the Physio-Medical College of Indiana, at Indianapolis, in 1882. He was listed in 1886 as in Grand Rapids, Michigan; his name did not appear after that year.

— **Lafayette,** believed to be a native of France, married, about forty years of age, came to Lansing, Mower County, from Red Wing, Goodhue County, in the autumn of 1866. Of the eclectic school, he carried on a successful practice in Lansing for about three years before removing to Missouri.

O. M. Landon practiced for a short time in Taopi in 1882. Dr. O. M. Landon, a graduate in 1882 from the State University of Iowa, was listed from 1886 to 1890, inclusive, as in Lawyer, Chickasaw County, Iowa. In 1893, listed as Dr. Oren M. Landon, he was in New Hampton, Iowa.

A. J. Lewis practiced at Rose Creek in the middle nineties. In 1898 Dr. Arthur J. Lewis, a graduate in 1895 from the Medical Department of Hamline University, was in Mora, Kanabec County, Minnesota.

Charles F. Lewis, according to Armstrong, was an oculist who began, in 1898, to spend one day a week in Austin, and thereafter, it appears, established his home there. It has been noted that Charles Fremont Lewis was born in 1868, was graduated from the Medical Department of Vanderbilt University, Nashville, Tennessee, in 1901, and was licensed to practice in Minnesota in 1903. He was an early member of the Mower County Medical Society and in 1910 served as president.

George L. Lewis, from Atchinson, Kansas, came to Austin in 1878 and remained a year or so.

W. D. Little opened an office at Sargent, Mower County, in 1896. He previously had spent a few years at Blooming Prairie, Steele County. On February 8, 1884, a Dr. W. D. Little, then of Mazeppa, Wabasha County, was licensed in Minnesota. He held certificate No. 808-1 (R).

Benjamin F. Lockwood, another practitioner about whom little has been learned, was a homeopathic physician and surgeon who came to Austin in 1898. He was graduated from Hahnemann Medical College and Hospital, Chicago, in 1885. The following year he was practicing in Honeoye, Monroe County, New York; from 1893 to 1896, inclusive, he was in the same county, at Rush. After the official listing in Austin, Minnesota, in 1898, his name did not appear.

Eugene W. McCord (1854-1913), to whom reference was noted as having had "a temperance drugstore," possibly in Austin in the early eighties, was in fact in Albert Lea, Freeborn County, for some time in the late seventies. Gullixon, in his notes on the medical history of Freeborn County, gave an interesting account of Dr. McCord's life: born in Titusville, Pennsylvania in 1854; spent his youth in Waverly, Iowa; was graduated from Jefferson Medical College, Philadelphia; was physician and druggist in Freeborn County beginning in 1877; later in Luverne, Rock County; and from 1884 in St. Paul. He was licensed in Minnesota by examination on December 31, 1883. In St. Paul, he was for a number of years on the staff of the City and County Hospital, became a member of the Ramsey County Medical Society in 1891, and of the state medical society the following year. He died in St. Paul in December, 1913.

— **McCormick,** it seems probable, was the "Dr. Cormick" mentioned in the general history of Mower County of 1884. See *Dr. Cormack,* in this list.

Alexander MacDonald (1856-1947) was in Austin, Mower County, from 1883 to 1897. He settled in Chatfield (Olmsted and Fillmore Counties) in 1901. A detailed biographical sketch appeared in the medical history of Fillmore County.

Born November 6, 1856, at Perth, Lanark County, Ontario, Canada, Alexander MacDonald was one of the five children of Mr. and Mrs. Joseph MacDonald, both of Scotch descent. In Canadian schools and colleges he received a superior preliminary education, and in 1883 was graduated with honor from McGill University with the degrees of doctor of medicine and master of chirurgery. In that year he began medical practice in Austin, Minnesota, and soon was appointed examiner for the United States Bureau of Pensions in that city. He was licensed in Minnesota on January 2, 1884, certificate No. 767 (R), and in 1887 was licensed to practice in Wisconsin and Iowa also. In the 1890's he served as Mower County physician.

Although by 1883 physicians of the established schools of practice had much decreased their use of the newspapers as a means of introducing themselves to the public, Dr. MacDonald used them freely to list his attainments and the diseases in which he specialized. He spent some time at the White Beaver Medical and Surgical Institute of St. Paul and La Crosse, with Dr. David Frank Powell (White Beaver), and in 1885, when he established his own dispensary in Austin, greatly increased the size and frequency of his statements in the local press.

For a time, Dr. C. H. Johnson, who came to Austin in 1884, was associated with Dr. MacDonald.

On September 30, 1890, Alexander MacDonald was married to Margaret Anna Forster, a native of Olmsted County and a teacher in the schools near Chatfield. Dr. and Mrs. MacDonald had one child, William Joseph Alexander MacDonald, of brief and brilliant career: an athlete, a graduate in law from the University of Washington, Seattle, and a valiant soldier in the Rainbow Division, World War I. He was killed in action in the Argonne on October 14, 1918. He was awarded the Distinguished Service Cross, and MacDonald Field, of the University of Washington, was named for him "for all time."

From 1897 to 1901 Dr. MacDonald practiced medicine in Ortonville, Big Stone County, where he served as secretary of the board of examiners of the United States Bureau of Pensions. In 1901 he settled in Chatfield and practiced there and in nearby villages. In his later years he retired from practice. Mrs. MacDonald died in August, 1943; Dr. MacDonald, in April, 1947.

William Henry McKenna (1843-1932) was a leading physician in southern Minnesota from 1872 until his death. He spent eight years in Caledonia, Houston County, and forty-nine years in Austin, Mower County.

William H. McKenna was born in Wheeling, West Virginia, May 1, 1843, one of the seven children of William Henry McKenna, native of Ireland, and Mary Ann McKenna, who was born in Scotland, of Scotch-Irish parents. His sisters were Maggie, Kate, Sarah, Alice and Mary Ann; he had one brother, John.

After completing his preliminary education in the schools of his native town, William H. McKenna studied medicine under the preceptorship of a physician of Wheeling. At the outbreak of the Civil War, while he was still studying medicine, he joined the Confederate Army, with which he served as a surgeon until he was taken prisoner at Paris, Kentucky, and was sent to Chicago to await an exchange of prisoners. After the close of the war he continued his medical study at Richmond, Virginia, and thereafter he was delegated by the government to go as a physician into the Northwest.

In 1872, Dr. McKenna took graduate work at the medical school of the University of Michigan and at the same time served on the faculty as assistant professor of anatomy. In that year, on completion of his work at the university, he obtained his license (exemption certificate No. 192-3) to practice medicine in Minnesota and settled in Caledonia, Houston County. In this period he was married to Mary Ellen King, a school teacher, who was born at Louisville, Kentucky, of Irish parents. Dr. and Mrs. McKenna had four children: Paul, Mayphine, Estella and Jay.

In Caledonia, Dr. McKenna entered into active professional life in the conduct of a widespread practice and in civic responsibility. He served as county physician, as local health officer, and in 1881 as county coroner. He kept a large stable, in order that he might answer calls at all hours, in all seasons, and at the same time protect his unusually fine horses, which he cherished, by changing teams every few hours. In later years, his elder son Paul accompanied him on his rounds, driving the team. Dr. McKenna's experiences in practice, in Houston County and in his earlier years in Mower County, were the arduous and hazardous ones of the true pioneer physician.

In 1883, Dr. McKenna moved with his family from Caledonia to Austin, and in the latter city and community he continued in heavy general practice. A man of wisdom, tolerance, and sympathetic understanding, an able and ethical physician, he was identified with civic and medical progress. In Austin he served as city physician. He was an early member of the Mower County Medical Society, and was a member of the Minnesota State Medical Association and the American Medical Association. He was a member of the Catholic Church and a generous

contributor to charitable and educational institutions. Politically, he was a Democrat. His family and his profession were his chief interests. Farming became a practical avocation. In fishing, he found his favorite recreation.

When Dr. William H. McKenna died in Austin April 26, 1932, of coronary disease, he was survived by his wife, his sons and his daughters. Mrs. McKenna died in 1933. In the early nineteen forties Paul K. McKenna, physician and surgeon, was practicing in Mount Sterling, Kentucky, and Jay K. McKenna, physician and surgeon, and Mayphine (Mrs. Joseph) Graf and Estella McKenna were in Austin.

In 1957, Dr. Jay K. McKenna continued in practice in Austin and had in association with him his daughter, Dr. Elizabeth McKenna, a graduate in medicine from the University of Minnesota in 1949. Mrs. Graf and Miss McKenna continued to make their home in Austin. Dr. Paul K. McKenna died in 1954. His son, Dr. William Henry McKenna, a graduate of the University of Louisville, succeeded him in practice in Mount Sterling, Kentucky.

Otto C. Maercklein, born in 1874, was graduated from the Milwaukee Medical College in 1897. On June 16, 1898, he was licensed to practice medicine in Minnesota, receiving state certificate No. 921. At about that time, it is believed, he opened an office for the practice of medicine in Adams, Mower County, where he remained until about 1905. Dr. Maercklein was an early member, and probably an organizer, of the Mower County Medical Society, and was a member of the Minnesota State Medical Association. By 1906, he had settled in North Dakota, first in Ashley; by 1914 he was established in Dickinson, and by 1927 in Mott, Hellinger County. He became a member of the North Dakota State Medical Association. In 1956, retired from practice, he continued to reside in Mott.

To date, unfortunately it has not been possible to communicate with members of the **Maercklein** family, several members of which have been physicians, two of them in Mower County, Minnesota.

Bernard G. Maercklein, born about 1848, was graduated from the Medical Department of the University of Pennsylvania in 1887, and probably soon after that came to Milwaukee, Wisconsin. He was one of the founders of the Milwaukee Medical College and held the chair of oral surgery. Later he was professor of oral surgery at Marquette University. He was a member of the Wisconsin State Medical Society. He died in the Radium Hospital, Milwaukee, September 30, 1915, from carcinoma, aged sixty-seven years. He was licensed in Wisconsin through the "years of practice" section of the Medical Practice Law of the state.

Charles J. Maercklein was born in 1876 and was graduated from the College of Physicians and Surgeons, Milwaukee, in 1902. He was licensed in both Wisconsin and Minnesota, in the latter state on April 17, 1903, receiving certificate No. 1595. Dr. Maercklein practiced medicine in Le Roy, Mower County, from 1903 or 1904 to about 1908. By 1909 he was in Lidgerwood, North Dakota; in 1916 in Gackle, that state; and in 1918 in Bowman. In 1927, he was listed as in Elk Mound, Wisconsin; in 1940, Sheboygan; in 1956, Red Granite.

A. G. Maercklein was graduated from the College of Physicians and Surgeons, Milwaukee, in 1902. He was licensed in Minnesota on October 24, 1902, certificate No. 1574. From 1927 to 1956 he was listed in official directories as of Ellendale, North Dakota.

Ivan Rudolph Maercklein was graduated from the Milwaukee Medical College in 1903 and was licensed in Minnesota October 21, 1914, receiving certificate No. 4067. In 1927 he was in Wishek, North Dakota. His name did not appear in directories of 1956.

Bernard Webb Maercklein was a graduate in dentistry in 1911 in Wisconsin.

Josef (or Joseph) Mark, believed to have been the first Jewish physician to practice medicine in Minnesota, came to the United States from Russia in 1877. The son of a physician, Dr. Haskel Mark, he was born in 1852 in Pren (later Kovno or Kaunas), Lithuania. He was graduated in 1871 from Kovno Medical College, and on September 4, 1872, was licensed by "Savalskajo Gubernia Administration," and thus entitled to practice throughout the Russian Empire.

On October 15, 1883, Dr. Mark, then in Minneapolis, received Minnesota license No. 166 (R). At about that time, with his wife he settled in Caledonia, Houston County, where he practiced for several years. In 1886 the family was in St. Paul; a son, Daniel Benjamin Mark, was born there in that year. Dr. Mark then had a drugstore on Reany Street, St. Paul; it is not clear that he was practicing medicine. There is record that he practiced at different times in various counties of the state: in the early nineties in Minneapolis, Hennepin County, and again later for many years; in 1896 in Lyle, Mower County; 1903 in Marshall County; 1909 in Hibbing, St. Louis County.

Dr. Mark died in Minneapolis in 1926, at the age of seventy-four years. He had retired from practice four years before his death, after forty-five years as a physician in Minnesota. In the early years, members of the family have said he was a true

pioneer physician who experienced the typical vicissitudes of the time; scanty equipment, bad roads and weather and, in winter, travel in primitive conveyances with improvised heaters.

Dr. Mark was survived by his wife, who in 1956 continued to make her home in Minneapolis, and by his son, Dr. Daniel B. Mark (1886-1948), who for thirty-four years was a practicing physician of Minneapolis, and by grandchildren. A sister and a brother, Sam, were residents of Minneapolis. In 1957, Dr. Vernon H. Mark, formerly in military service, son of Dr. Daniel B. Mark, was in practice in Minneapolis.

H. D. Martin, in 1879, started an Eye and Ear Infirmary in Austin in which patients could be "treated by the week or by contract," with satisfaction guaranteed and consultation free.

John Lewis Martin (1806-1885) was from 1856 until his death, farmer, Wesleyan Methodist minister and actively practicing homeopathic physician in southern Minnesota, successively in Mower, Olmsted and Dodge Counties. He has been mentioned as in Fillmore and Jackson Counties also, but record of such residence has not been observed. Dr. Martin has been described as a small, wiry, bewhiskered man, dignified and respected, who commonly rode on horseback to make his professional calls and to relieve in the pulpits of his brother clergymen.

Born September 17, 1806, in Madison County, New York (sometimes given as Albany, Albany County), John Lewis Martin was one of a family of seven children whose parents were John L. Martin, from the north of Ireland, a teacher in a school for boys, and Mary Martin, a seamstress, a native of Edinburgh, Scotland. In early adult years he was a clerk in a store. His medical training is not known; one of his descendants recalled that he had a medical certificate that had been issued in New York State. John L. Martin was married in Albany, New York, to Emmeline J. (the name later was changed to Elizabeth Ruth at his request) Berghes, a teacher of music. About 1850 he came with his wife and children to Valparaiso, Indiana, and in 1856, by ox cart, into Mower County, Minnesota, where he farmed in section 15, Frankford Township, and practiced medicine over a wide territory. It is said that he conducted the first neighborhood school of the community in his log house, and that during the diphtheria epidemic of 1866 he rendered faithful service. Mrs. Martin died December 10, 1870, in her fifty-first year, and was buried in Frankford Cemetery. Still in Frankford in 1874, there is some record that during the next two years Dr. Martin and his children were living in or near the village of High Forest, Olmsted County.

For several months in 1876 and early 1877, a Dr. Martin, homeopath, was in Eyota, Olmsted County, in partnership with Dr. Isaac M. Westfall. In 1877 Dr. John L. Martin settled in Wasioja, Dodge County, so that his eight children (three had died in infancy) might be educated at the Wasioja Seminary. In Wasioja Dr. Martin continued to preach and to practice medicine. He died in Wasioja from cardiac disease on September 22, 1885, and was buried beside his wife in Frankford Cemetery. In 1942 his children were long since dead; several grandchildren and great-grandchildren survived.

— **Mattson,** in 1887, probably an itinerant, was one of the several practitioners in Mower County, and perhaps in Freeborn County, about whom information has not been gained.

Simeon Paul Meredith (1852-1930), homeopathic physician, a graduate of the Hahnemann Medical College and Hospital in Chicago in 1882, from that year until his death was a respected physician in various counties in southern Minnesota. Detailed biographical notes appeared in the medical history of Fillmore County.

Born on January 27, 1852, at Middleton, Wisconsin, Simeon P. Meredith received his early education in the local country school, studied at the University of Iowa, later taught the rural school near Middleton, and next qualified as a physician. He began practice in the middle seventies in Jefferson, Wisconsin, and later was in Spring Green, that state.

Shortly after his graduation from medical college in 1882, he came to Minnesota because of ill health and first practiced in Austin, Mower County. Under the Affidavit Law of 1887, then in Plain Prairie, he was licensed in Minnesota. By 1888 he was in Spring Valley, where he practiced nearly ten years. He may have gone from there to Owatonna, Steele County. In February, 1899, he moved to

Pleasant Grove, Olmsted County, to assume the practice and drugstore of Dr. M. T. Bascomb who had died the previous month; there he served as county physician for the village and the township. In the spring of 1902, he returned to Mower County, to Grand Meadow, but by October, that year, he had moved to Windom, Cottonwood County. After several years, he went to Garden City, Blue Earth County. In 1908, he retired from practice and made his permanent home in Mankato.

Before leaving Wisconsin, he was married to Fannie Glasier, of Bedford, Ohio. There were two children of the marriage, Eva L., who died in 1934, and Harlan.

Dr. Meredith died in Mankato on September 1, 1930. He never had been in good health, and for many years had suffered from bronchitis and asthma. He applied his limited strength exclusively to the practice of his profession.

Melvin C. Millet (1868-1907) practiced two years in Le Roy in the late nineties in partnership with Dr. Milan J. Hart.

He was born September 22, 1868, in Sumner Township, Fillmore County, near Hamilton, the son of Mr. and Mrs. Roscoe G. Millet. After attending the district school he studied two years at the Winona Teachers College, taught district school one year, and read medicine for one year with Dr. Rollo C. Dugan of Dover, Olmsted County. In the autumn of 1892, he entered the medical school of the University of Minnesota, from which he was graduated with high honors in June, 1895. He was licensed by examination in Minnesota on June 11, 1895, and received certificate No. 529 (R). After an initial practice of a year and a half in Dover, he joined his old friend and classmate, Dr. Milan J. Hart, in Le Roy, Mower County. Late in 1898, he became a member of the staff of the Drs. Mayo, Graham and Stinchfield of Rochester (group called "Mayo Clinic" beginning in 1912).

Melvin C. Millet was married on June 12, 1901, to Mary A. Frick, of Minneapolis, a daughter of Mr. and Mrs. Thomas W. Frick of that city. Dr. and Mrs. Millet had one child, Roscoe Frick Millet.

When Dr. Melvin C. Millet died at his home in Rochester from Bright's disease May 7, 1907, his brilliant professional career had measured only twelve years. He was survived by his wife, his son, and his parents, two sisters, and one brother. His son, Roscoe F. Millet, a graduate of Northwestern University in 1930, has practiced medicine in Macomb, Illinois, since 1942.

P. E. Minckler practiced in Brownsdale in the later seventies. This physician perhaps was the "Dr. Minkler" mentioned in the history of Mower County of 1884, who came to Brownsdale from Westfield, Wisconsin, some time in 1875. He was a graduate of a medical college in Canada, remained in Brownsdale a short time, and returned to Wisconsin.

— **Mitchell** has been mentioned as having practiced in Grand Meadow. The name probably refers to Dr. Ralph Sidney Mitchell, born in 1874, licensed in Minnesota in 1903, then of Grand Meadow.

George E. Moon is said to have been in Le Roy in 1869. If so, his stay was brief, for in the same year he studied with Dr. A. C. Wedge in Albert Lea, and soon afterward was practicing in Geneva, Freeborn County. After about a year, he left for Yankton, Dakota Territory, where in 1884 he died by his own hand, from an overdose of morphine.

In the late 1890's, there were listed in medical directories three practitioners of the name *Mary E. Morrison,* one of them Mrs. Mary E. Morrison, and a Mrs. Mary Morrison.

Mary E. Morrison who was in Austin, Mower County, around the turn of the century was almost certainly Mrs. Mary E. Morrison, a graduate from the Physio-Medical School, in Indianapolis, in 1897. It is believed that this practitioner and Mrs. Mary Morrison were the same person; Mrs. Mary Morrison was listed in 1898 as in Anderson, Madison County, Indiana, "no report on qualifications." In that year, or in 1899, Mrs. Morrison came to Austin; her name appears as a practitioner in this city in 1900 and 1902 but not in 1904.

Of the other two practitioners of this name, one was a graduate of the Medical Department of Howard University, Washington, D. C. in 1886, and apparently continued in practice in that place. The second physician of this name was a graduate of the University of California in 1894, and was in practice in San Francisco at least through 1900.

D. F. O'Connor, who practiced medicine in Grand Meadow from perhaps 1893 to 1899, inclusive, was, there seems little doubt, Dr. Dennis F. O'Connor, a graduate of the College of Medicine and Surgery of the University of Minnesota in 1890. He was listed in 1896 and in 1900 as in Grand Meadow. In 1897, he was admitted to membership in the Minnesota State Medical Society. In 1898, Dr. O'Connor sold his practice to Dr. Willard W. Freeman, who came from Caledonia, Houston County, to Grand Meadow. Members of Dr. Freeman's family recall that Dr. O'Connor remained in the village for some time after Dr. Freeman began practice there. In 1900, Dr. O'Connor was in St. James, Watonwan County, where he remained through 1904. By 1906, he was in Maxbass, North Dakota.

In a revised roster of the Minnesota Valley Medical Association dated May 12, 1896, appears the name of Dr. F. O'Connor of St. James. It is possible that this was Dr. D. F. O'Connor and that he practiced in St. James both before his stay in Grand Meadow and afterward.

H. Pagin, an eclectic physician who announced himself as a graduate of the Medical Department of the State University of Missouri, practiced for a time in partnership with Dr. D. Strock in Austin in 1878. They advertised widely and were "specialists in chronic diseases." Dr. Strock left Austin that year for Indiana, and it seems a reasonable assumption that Dr. Pagin was not a long-term resident.

Homer Francis Peirson (1867-1938) practiced medicine in Austin forty-two years, from 1896 until his death.

Born at a farm home west of High Forest, near Stewartville September 11, 1867, he was the son of Frederick Moses Peirson (1834-1913), a native of Vermont, and Catherine Keyes Peirson (1836?-1912), who was born in Ireland. The only other child of the marriage, Alonzo, died in infancy in 1864.

In New England, the Peirson and Saxton forebears of Frederick M. Peirson were of English descent and served with the American forces in the Revolutionary War. Frederick M. Peirson and his older brother John Saxton Peirson when young boys came with their parents and other members of the family from Vermont to Ohio and later to Illinois and to Wisconsin. From La Crosse the two brothers came to Mower County in the summer of 1854 and filed on adjoining claims in what was later called the "Mile Strip" which, in 1857, was annexed to Olmsted County. These farms remained in the respective families for more than eighty-five years. In November, 1860, F. M. Peirson brought his bride to the substantial grout house which he had built on his claim. On their farm during the Civil War years, Mr. and Mrs. Peirson kept a tavern for convenience of travelers from Winona to western Mower County. In 1874, they moved to Rochester, where they ran the Stevens Hotel for three years. In 1877, they bought the Brown Hotel, in Grand Meadow, Mower County, which they operated and made their home until 1898, when they retired from business. In 1911, they moved to Austin.

In Grand Meadow, Homer F. Peirson grew up and received his preliminary education. He spent one year at Carleton College, Northfield, before entering the University of Minnesota, from which he was graduated in 1891. At the university he was a member of Theta Phi Fraternity, and was one of the editors of "The Gopher" in 1891. Thereafter he read medicine one year with Dr. Horace H. Witherstine, of Rochester, before entering Rush Medical College, from which he received his degree in 1895. On completion of his internship at St. Mary's Hospital, Minneapolis in 1896, he began the practice of medicine in Austin.

On June 14, 1898 Homer F. Peirson was married to Jessie Eleanor Allen, of Grand Meadow, whom he had known since childhood. Mrs. Peirson was the daughter of Mr. and Mrs. Gilbert Allen, who had settled in Grand Meadow in 1874. Mr. Allen operated a store and for several years was surveyor for Mower County.

In Austin, Dr. Peirson devoted himself to his profession. His offices were over Wold's Drug Store, at the corner of Main and Bridge Streets. Although he took little part in local politics, he served as county physician, and as county coroner for many years. Active in fraternal organizations, he was a member of the Independent Order of Odd Fellows for more than thirty years, Aerie physician for the Fraternal Order of Eagles for many years, and medical examiner for a number of other organizations.

In 1896, Dr. Peirson was president of the original or "old" Mower County Medical Society. When the present county medical society was founded, in response to the program of organization started in 1902 by the state medical society, he was one of the first members, and was one of the early presidents of the group. He was a member of the Minnesota State and the American Medical Associations.

His two great interests in life were his profession and his family. A skilled and ethical physician, friendly and helpful, he held the respect and liking of physicians and laity. In his middle years he was of rugged physical appearance, had bushy eyebrows, and wore a heavy moustache; at times he affected a rather brusque manner which, however, misled no one. He was a devoted husband and father, always kind and considerate in his home, and was a genial host to guests. The family were members of the Congregational Church.

In the last two years of his life, Dr. Peirson was in failing health, but refused to give up his practice of medicine, and went daily to his office. It was there that he was stricken with the cerebral hemorrhage from which he died a few hours later, March 24, 1938. He was survived by his wife and two daughters, Helen (Mrs. Cyril B. Bell) and Marion (Mrs. A. M. Steenerson) and five grandchildren. In 1957, Mrs. Peirson continued to make her home in Austin; Mrs. Bell was in Huntington Beach, California, and Mrs. Steenerson in Minneapolis.

Thomas Phillips, Canadian born, a graduate of the University of Chicago in 1880 and of the Hahnemann Medical College and Hospital, Chicago, in 1882, began the practice of medicine in Austin in May, 1882. Local comment at the time was, "Dr. Phillips is a young man of good attainments, and promises to make a successful physician." He specialized in the diseases of women and children. On December 31, 1883, he was licensed in Minnesota, under certificate No. 657 (H). In 1884, in Austin, he served as chairman of the board of health. In 1888, according to local record, he removed to Iowa, although in 1890 he still was listed in a medical directory as in Austin. In 1893, he was in Raymond, Blackhawk County, Iowa; by 1900 he was in Iowa Falls, Hardin County.

John J. Platt (1875-1927) began his initial practice of medicine in Dexter, Mower County in 1895, the year of his graduation from the College of Medicine and Surgery of the University of Minnesota. He was licensed in the state in June, 1895. Local record is that he removed from Dexter to Rudd, Iowa; his stay in Iowa was brief, for in 1896 he was practicing in Minneapolis.

From 1898 until his death, he was a resident of St. Paul. On October 31, 1883, he was admitted to membership in the Ramsey County Medical Society. In the files of the society is his application for membership, in his handwriting, in which he stated that he was born in Rochester, Minnesota, on February 26, 1875; that he was graduated from a St. Paul high school, and, as noted, from the University of Minnesota in 1895. During World War I, he served with the Armed Forces of the United States as a major in the Medical Corps.

Dr. Platt died in St. Paul on September 12, 1927, from pulmonary tuberculosis, after a long illness. From the record in medical directories, one may assume that he had retired from practice some years before his death, or that for a long time his professional activity had been intermittent.

Albert Plummer (1840-1912), a distinguished physician, practiced medicine in the community of Hamilton, Fillmore County, twenty-four years, and in Racine, Mower County, eight years, beginning in 1893. The last year of his life he spent in Rochester. A detailed biographical sketch of Dr. Plummer appeared in the medical history of Fillmore County.

Born at Auburn, Rockingham County, New Hampshire, September 7, 1840, Albert Plummer received his early schooling at Auburn and at the Kimball Union Academy, New Hampshire. He studied medicine under the preceptorship of his father, Dr. Nathan Plummer, and the special knowledge thus acquired proved useful during his three years of active service in the Civil War. In the autumn of 1865, he entered the medical department of Dartmouth College; later he transferred to the medical school of Bowdoin College, Brunswick, Maine, from which he was graduated in 1867.

In 1869, Dr. Plummer began practice at Hamilton. He soon became a member of the Fillmore County Medical Society and of the Minnesota State Medical Society (reorganized that year) and cooperated with the State Board of Health (established

1872). In 1882-1883, he served in the state legislature as representative from his district. On January 15, 1884 he received state medical license No. 737 (R).

He was married to Isabel Steer at Sumner, Fillmore County October 10, 1872. To this marriage were born four children, two of whom died in infancy. Henry Stanley Plummer (1874-1936) and William Albert Plummer (1883-1949) became able physicians, known for their work as members of the staff of the Mayo Clinic.

After settling in Racine in 1893, Dr. Plummer continued his extensive intercounty practice. For two years (1898-1900) he was aided by Dr. H. S. Plummer. In 1911 Dr. and Mrs. Albert Plummer made their home in Rochester; Dr. Plummer died March 20, 1912; Mrs. Plummer January 15, 1936.

Henry Stanley Plummer, elder son of Dr. Albert Plummer, was born March 3, 1874, at Hamilton, Fillmore County. He received his early education in the schools of Racine and Spring Valley. On graduation from the medical school of Northwestern University, in 1898, he joined his father in practice at Racine. In 1900 he became a member of the staff of the Drs. Mayo in Rochester. He died in Rochester December 31, 1936. See also in the medical history of Olmsted County.

J. F. Preston, a native of Connecticut who came to Minnesota from Youngstown, Ohio, has been mentioned as having been in Brownsdale, Mower County, in the late eighteen seventies. In 1878, according to a local newspaper of that year, he was in Alden, Freeborn County, "a pleasant and agreeable gentleman," physician and surgeon, who specialized in eye work and also ran a drugstore. In 1880, he sold the store to Dr. R. V. Perry of Alden and returned to Ohio. Later, he came West again, to Decorah, Iowa, for a few years, it was said, and in April, 1889, once more established himself in Alden, bought a drugstore, and built up a good medical practice. After a short time he returned to Youngstown, Ohio.

Of interest is a recent statement that Dr. J. F. Preston was listed in a directory of 1890, "no report." In 1893, Dr. James F. Preston, of Youngstown, Ohio, was listed officially as a graduate from the American University of Pennsylvania (Philadelphia) in 1875; in 1896-1898 Dr. Preston was listed as in Mason City, Iowa.

D. P. Putney was listed in an official directory of physicians and surgeons, in 1886-1890, as practicing in Frankford, Mower County. His professional qualifications were not stated. Other mention of this practitioner has not been noted. At the time of his residence in Frankford, the village, a few miles from Grand Meadow, had a population of one hundred, which decreased in the next few years to fifty.

Samuel H. Rabuck, a graduate from Rush Medical College, Chicago, in 1896, practiced in Lyle, Mower County, in 1897-1898. In 1900, he was in Bloomville, Delaware County, New York, and from 1902 through 1904 in Bovina Center, in the same county. He was one of the many physicians who, it seems, were briefly in one county or another of the state before the turn of the century.

F. Q. Remington is said to have been in Austin in 1881, and in Grand Meadow for a short time. "He left the next summer."

Calvin Hubbard Robbins (1840-1900) was well known in southern Minnesota for many years, in Austin for two years. A detailed biographical sketch of Dr. Robbins appeared in the medical history of Fillmore County.

Born in St. Lawrence County, New York December 20, 1840, Calvin H. Robbins was one of the five children of Marcus Robbins and Fanny Hubbard Robbins, both of English descent, of distinguished ancestry. In 1859 the family came to Fillmore Township, Fillmore County, Minnesota. Calvin Robbins went to school in Fillmore and Chatfield, and for a year or two taught in the rural schools of his community before entering on three years of medical study in the office of Dr. Luke Miller, of Chatfield. During the Civil War he served with the Union Army. On his discharge from military service in October, 1864, he enrolled at the medical school of the University of Michigan; a year later he transferred to the Medical College of Keokuk (Iowa), from which he was graduated in 1866. In that year, he began the practice of medicine in the village of Fillmore, and became a charter member of the Fillmore County Medical Society (October, 1866).

In November, 1866, Calvin H. Robbins was married to Rosalia R. Mosher, a school teacher, formerly of Canton, New York. Dr. and Mrs. Robbins made their home in Fillmore for nine years where their five children were born. In 1875 the family moved to Wykoff where they remained for twenty years.

In 1871, Dr. Robbins became a member of the Minnesota State Medical Society, and in the ensuing years served on many committees of the society. After the passage of the "Diploma Law" of 1883 he received certificate No. 550 (R) dated December 31, 1884. During the eighties, he served as an examining surgeon for the United States Bureau of Pensions of Fillmore County. In 1895, Dr. Robbins moved to Spencer, Iowa, where he owned and managed the *Spencer Reporter*.

By 1898 Dr. Robbins had left the newspaper field and had settled in Austin, Mower County, where he successfully resumed the practice of medicine and where he was known as "a gentle and courteous physician of the old school." He died in Austin February 28, 1900, from angina pectoris, survived by his wife, five children, and two brothers.

Samuel W. Rutledge, a graduate of the Homoeopathic Medical College of Missouri in 1876, came in 1879 from Cresco, Iowa, to Rose Creek, Mower County. Record is sparse. June 12, 1885, he was licensed to practice in Minnesota as possessor of certificate No. 1067 (H). On July 15, 1885, then of Grand Forks, Dakota, he was licensed to practice in Dakota Territory.

George Jacob Schottler (1870-1951) was a valued citizen and physician of Dexter, and Mower County, for fifty-four years, from 1896 until his death.

Born at Rockfield, Washington County, Wisconsin November 5, 1870, George J. Schottler was the son of Nicholas S. Schottler and Anna Regenfuss Schottler. He received his early education in the schools of his native county, and thereafter took a teacher's course at the normal school of the University of Indiana, at Valparaiso, Indiana, from which he was graduated with the degree of bachelor of science in 1892. After teaching a few terms of school, he began the study of medicine, and in 1896 was graduated from Rush Medical College, Chicago. In that year he began the practice of medicine in Dexter and the community. Throughout his career he kept in touch with medical advance by graduate work, outside study, and activity in medical societies.

Dr. Schottler was interested in the organization of St. Olaf Hospital, Austin, and was one of the first to avail himself of its facilities in his practice. He was founder of the Mower County Medical Society, its first treasurer, and later its president; was a member of the Southern Minnesota Medical Association, the Minnesota State Medical Association, and the American Medical Association. In Dexter he served as health officer, and on the board of education, for two terms each as treasurer and as president. He was vice-president of the First State Bank of Dexter. He attended the Community Church of Dexter.

In 1942, Dexter and community honored Dr. Schottler on his seventy-fifth birthday with a party sponsored by the American Legion Auxiliary of the village. March 26, 1947, Dr. Schottler was an honored guest, together with Dr. O. H. Hegge, of Austin, and Dr. A. E. Henslin, of Le Roy, at a dinner given by the Mower County Medical Society, at Austin, in tribute for the more than fifty years of devoted service each of the honored guests had rendered Mower County as a physician and surgeon. The reminiscences of their early experiences in practice, of the three deans of medicine, were a highlight of the occasion.

On September 12, 1900, at Dexter, George J. Schottler was married to Kathleen Vermilyea. Dr. and Mrs. Schottler became the parents of four children, three sons and a daughter. When Dr. Schottler died February 15, 1951, he was survived by his wife and by the four children: Dr. Max E. Schottler, of Minneapolis; Kenneth, of Duluth; Jesse, of White Plains, New York; and Kathryn (Mrs. P. C. Remington), of Chicago. Mrs. G. J. Schottler died June 26, 1955.

Dr. M. E. Schottler said of his father, "His only hobby was work at the practice of medicine. He had a wonderful garden and enjoyed it immensely, he vacationed at Lake Ponto and loved the vacation, but still always worked."

Rollon W. Simmons, a graduate of the Cincinnati Medical College, was the first physician to practice at Dexter, Mower County. He came in 1873, remained two or three years, and returned to Indiana, his former home. His successor in Dexter was Dr. Lyman D. Jackson, in 1877, who removed to Grand Meadow in 1879.

L. Douglas Smith was a "great magnetic healer," self described, who imposed on both Austin and Albert Lea in 1894. Not eligible for inclusion in this list of physicians, he is mentioned merely as one of a type. Of possible interest are the

following listings, all with "no report," of L. D. Smith: in 1896 in Wausau, Wisconsin; 1898, La Crosse, Wisconsin; 1900 Los Angeles, California, and Longmont, Colorado. The name did not appear in 1902.

Rensselaer Soule was a pioneer physician who came to Lansing Township, Mower County in 1865. He was born in Fairfield, Franklin County, Vermont, one of the ten children of Salmon Soule and Sara Soule. He was graduated in medicine from the University of Vermont, at Burlington, and thereafter practiced medicine in Vermont, first in Fairfield, later in North Fairfax, and in Canada. December 23, 1833 he was married to Susan Richardson of North Fairfax. Dr. and Mrs. Soule were members of the Episcopal Church. Of their seven children, two were born in Fairfield, and five in North Fairfax. The family traced descent from George Soule, a Mayflower passenger, and on the maternal side, from Miles Standish.

When Dr. and Mrs. Soule came to Mower County, they were accompanied, it is said, by their six surviving children, then grown, some of them married. In Lansing Township Dr. Soule bought a large tract of land which he divided among the children. A daughter, Bessie Soule, become the wife of Alvah E. Beadell, a farmer of the township. One of the sons, Rensselaer Soule, Jr., first settled in Lansing village and later moved on to a farm; his wife was Cornelia L. Hawley, of Mower County. Of this marriage, there were four children, one of whom was Herbert R. Soule, who on September 3, 1884, was married to Alice Padgett. Further record of the family has not been available.

Dr. Soule had not intended to practice medicine in Minnesota, but owing to the immediate local demand for his services as physician, he continued his professional work. In 1875, Dr. and Mrs. Soule made their home in Austin. Mrs. Soule died there in the spring of 1880, at the age of sixty-seven; Dr. Soule survived her until the autumn of 1880, when he died at the age of seventy-seven.

H. W. Spafford, who came to Mower County from Lake City, Wabasha County, spent part of 1875 in Austin.

James Phineas Squires was born at Dansville, Livingston County, New York August 25, 1851. In 1853, then in Wisconsin, he entered the United States Army as assistant surgeon of the 48th Regiment of Volunteer Infantry of Wisconsin. There is record that for two years, about 1870-1872, he practiced medicine in Blue Earth, Faribault County, Minnesota.

In 1872, Dr. Squires settled in Austin, Mower County. He had an extensive practice, which he sometimes dropped altogether, it is said, in order to devote his energies to his farm about eight miles south of the city. In 1880 he was admitted to the Minnesota State Medical Society; his name did not appear on the roster after that year. Although he has been listed unofficially as a homeopath, his Minnesota state license, dated April 16, 1884, was No. 867 (R). During his years in Austin, he was a member of the examining board of the U. S. Bureau of Pensions.

In 1887, Dr. Squires removed permanently to southern California. In unpublished notes on physicians of Steele County, a Dr. Squires is mentioned as practicing at Medford in 1880. It is possible that Dr. J. P. Squires may have been in Medford in the course of intercounty practice.

C. K. Stewart no doubt was **Charles K. Stewart,** a graduate of the University of Michigan Homeopathic Medical College in 1893, who came to Dexter, Mower County, in that year. In notes on the medical history of Olmsted County "Dr. Stewart," a homeopath, was mentioned as having been in Byron. An elderly citizen of the community expressed the belief that "Doc Stewart" had been in Byron briefly in the early nineties, recalled his personal appearance, that he once was called in an emergency, and that he soon went on "west."

Recent information makes the record clearer. After about two years in Dexter, Dr. Stewart removed to Iowa, where in 1896 he was in Washington, and in 1898 in Waterloo. In 1900, he again was in Mower County, in Brownsdale. In this period he supplied the following data about himself: "Member N. W. Surgical Acad. of Homo. Phys.; Ex-Secr. and Treas. Cedar Valley Homo. Med. Soc.: Ex-health officer, Dexter, Minnesota, and Med. Examiner M. W. of Am. Mill." Official listings place this practitioner in Byron, Olmsted County, in 1902, possibly his second stay in that village; in 1904 in Janesville, Waseca County, where he remained through 1910. Thereafter, he was not listed.

Thomas Stringer, another physician about whom little is known, practiced at Lansing, Mower County, about 1873.

D. Strock practiced in Austin for a while in 1878, and then left for Indiana. For a time, he was in partnership with Dr. H. Pagin, an eclectic practitioner, who probably was in Austin a short time. Drs. Strock and Pagin advertised freely in the newspapers. Both perhaps should be classed as itinerant practitioners.

— **Tanner,** a homeopath, practiced in Lyle for a short time in 1870.

French W. Thornhill, son of Samuel Payne Thornhill, M.D. (*q.v.*), was born in Coshocton County, Ohio, on July 18, 1843. At the age of nineteen years he entered the Union Army and during the Civil War served as assistant surgeon in the Wisconsin regiment in which his father was regimental surgeon. It seems obvious that Dr. Samuel P. Thornhill had been and continued to be his son's preceptor. After the war, French W. Thornhill entered the Cincinnati Medical College, from which he was graduated in 1869. In that year, he accompanied his father to Austin, Mower County, and there practiced medicine in partnership with him for three years. At the same time, he managed a farm in sections 5 and 6 of Austin Township that his father had bought from John I. Wheeler, who was moving into Freeborn County.

In 1872, Dr. F. W. Thornhill settled permanently in Spring Valley, Fillmore County, with his wife and children, and there continued as a practicing physician. In 1883 he received an exemption certificate on the basis of years of practice. He died at his home February 4, 1912.

Samuel Payne Thornhill (1821-1879) was born in Rockingham County, Virginia, March 21, 1821. Left an orphan when a small child, he lived for a few years with relatives, but early in life was thrown on his own resources for support and education. That he became an able physician and surgeon manifests his great native ability. He studied medicine under a preceptor in West Carlisle, Coshocton County, Ohio; in that community he began medical practice and married. His sons French W. Thornhill and Ampstead S. Thornhill (later a farmer in Mower County), and a third child were born in Ohio. While his children were young, Dr. Thornhill moved with them to Horicon, Wisconsin, and from there to Watertown, Wisconsin. His wife had died, and in Watertown he married again. Of the second marriage, there were two children. In 1848, the family moved to Janesville, Wisconsin, where Dr. Thornhill was in partnership with Dr. Treat, who later was well known in Chicago. In 1855, Dr. Thornhill settled in Hudson, Wisconsin, for seven years. When the Civil War began, he was made regimental surgeon of the 8th Wisconsin Volunteer Regiment, the Eagle Regiment under Colonel Murphy, and in 1862 he became brigade surgeon.

In the winter of 1869-1870, he came to Austin, Mower County, with his son Dr. French W. Thornhill, and there practiced for ten years, the first three with his son. Dr. S. P. Thornhill made his home with Mr. and Mrs. Alonzo Fairbanks. During the last few years of his life, Mrs. Fairbanks studied medicine under his preceptorship and later took her degree (see Ellen Backus Fairbanks). Dr. Thornhill was skillful, untiring in his service to the sick, and was well loved. At one time, it was reputed that he had the largest practice in the city.

When Dr. Thornhill died in March, 1879 from gastric hemorrhage, which perhaps, it was said, was induced by his addiction to alcohol, Ellen Backus Fairbanks wrote of him, in part, in the *Austin Register* of March 13: ". . . If he had faults, he also had virtues. To his friends he was generous, kind and true. A tender father to his children, and second to none in his professional acquirements, his loss to us is a public calamity."

S. P. Thornton practiced in Austin from 1869 until his death in 1879. He had been a regimental and a brigade surgeon in the Civil War. From the similarity in military record and in period of residence in Austin to those of Dr. S. P. Thornhill, it seems probable that the name was a misprint of "S. P. Thornhill."

Charles B. Thrall, a native of Pittsfield, Massachusetts, was a graduate of Rush Medical College, Chicago, in 1868. In a general history of Mower County, Minnesota (1884), it was stated that in 1874 Dr. C. B. Thrall came with his wife from Leon Valley, Wisconsin, to Le Roy, where he entered into partnership with Dr. E. J. Kingsbury. At one time, he served as county physician. Mrs. Thrall died at Le

Roy within a short time after their arrival in the village, and not long after her death Dr. Thrall left for La Crosse, Wisconsin, or vicinity, where, in 1884, he was "enjoying a lucrative practice." In the period 1886-1890, he was listed as living in Galesville, Trempealeau County, Wisconsin; in 1886, his name appeared on the roster of the Chippewa Valley Medical Association. He was not listed in medical directories in 1892.

A. Thrane was in Austin around 1874. He may have practiced medicine; "he probably ran a drugstore."

W. E. Todd, a son of the Rev. James D. Todd, was born in Wisconsin in 1861, and was graduated in 1890 from the Chicago Medical College. He practiced medicine in the logging and mining districts of Neaunce, Upper Michigan, and later in Madison, Mower County, Minnesota. In 1896, he went to Albert Lea, Freeborn County, to join his brother, Dr. J. M. Todd, in practice. In the medical history of Freeborn County, Gullixon gave full biographical sketches of Dr. W. E. Todd, Dr. J. M. Todd, and other well-known members of the family.

— **Torkelson** came to Lyle, Mower County, in 1882. There seems little doubt that he was the "Dr." Torkelson, a druggist, who in 1882 opened a drugstore in Hartland, Freeborn County. As Gullixon said, in those days all druggists prescribed medicine over the counter and were called "doctor." In 1885 a local newspaper stated: "Dr. Torkelson, our doctor, druggist and postmaster, has died." Death was due to consumption. About 1909, Peter T. Torkelson, M.D., came to Lyle.

Oscar H. Trenkler, a homeopathic physician, mentioned elsewhere as having been in Mower County, perhaps never practiced in the county other than in the course of intercounty calls. He was a graduate in 1854 from the University of Giessen, Germany, who came to the United States about 1857. In August, 1879, then from Portage, Wisconsin, he began practice in Albert Lea, Freeborn County. In May, 1881, he settled in Mankato, Blue Earth County, and was still there in 1886-1890, as listed in Polk's directory of physicians and surgeons. His name did not appear in official lists in 1893.

A. Truane, the first physician in Lyle, Mower County, settled there in 1870. He was said to be of the "old school" and a good physician. From Lyle, he went to Eau Claire, Wisconsin, where, in 1884, he was still in practice.

Ernest W. Tryon, a graduate of the Bennett Eclectic Medical College in 1885, practiced a few years in Austin, Mower County, in the nineties. There is uncertainty about the length of time he spent in different places of residence, but listings in official medical directories indicate the following approximation: Minneapolis, 1885-1890, perhaps later; Austin, 1895-1898; Dassel, Meeker County, about 1900-1903. From Dassel he went to Minneapolis, where he practiced until his death. Dr. Tryon was licensed in Minnesota on April 20, 1885, and received certificate No. 1039 (E). He died March 5, 1927, at the age of seventy, from coronary sclerosis and diabetes.

H. T. Turner, of Lyle, Mower County, was listed in an illustrated atlas of Minnesota, in 1874, as a druggist, who was born in Oneida County, New York, date not given. Armstrong commented that H. T. Turner, a homeopath and a dealer in drugs and medicines, came in 1871 to Lyle, where he reputedly had a "well-fitted and tasty drugstore."

It is probable, but not proved, that he was the Dr. Henry T. Turner who was in Kasson, Dodge County, at intervals between 1875 and 1889, when he went to Walla Walla, Washington. This man was born in New York July 16, 1837; was graduated in 1862 from the old Eclectic Medical College of Pennsylvania at Philadelphia. In Minnesota, date unknown, he was married to Miss Abbey Potter of Mower County. Again speculatively, Miss Potter may have been a member of the family of E. Potter, an early settler in Lyle Township.

In Kasson, in 1875, Dr. Turner advertised that he treated chronic diseases, and had cured fourteen patients suffering from asthma. In Minneapolis, in 1882, he soon returned to Kasson, reported that he had a cure for consumption. He was licensed to practice in Minnesota on December 31, 1883, certificate No. 718-3, by exemption. He was a Republican, served twice as health officer in Kasson, and at times presented bills to the county for aid to the poor. He died July 16, 1913 at the Washington State Veterans Home, of which he was resident physician.

Emma Washburn (later Rodgers) was born in Mower County, Minnesota, in 1860. She was graduated in 1887 from the Woman's Medical School of Northwestern University (Woman's Hospital Medical College, or Woman's Medical College), Chicago. This school was closed in 1902. After a year's internship at Northwestern Hospital, Minneapolis, she began the practice of medicine in Blooming Prairie, Steele County (1890-1891). In 1891, she opened an office in Austin, and for many years, it is said, had a good practice. She was licensed as a physician in Minnesota under the Affidavit Law of 1887, and again in 1898.

Dr. Emma Washburn Rodgers, of Austin, was listed in Polk's directory of physicians and surgeons for 1904; in the first edition (1906) of the directory of the American Medical Association her name appeared as Emma W. Rogers, but thereafter the spelling, in different directories, was uniformly "Rodgers." The following notes give an approximation of her movements: From 1910 through 1917 she was in Newport, Washington County, Minnesota; from 1918 through 1927 or later, in White Bear Lake, Ramsey County; in 1929 through 1931, "retired" in Carbondale, Illinois.

Dr. Washburn Rodgers died in Salem, Oregon, on September 13, 1933, in her seventy-fourth year, from cardiorenal-vascular disease.

— **Webber** may have practiced in Adams in 1877. In the atlas of Minnesota, 1874, mentioned previously, H. F. Webber, a patron of the publication, was listed as farmer and physician, in section 26 of Le Roy Township, post office Le Roy, who was born in Germany and had come to the United States in 1866. From about 1866 into 1868, H. WEBER, "German physician" and "hygiestic physician," was in Rochester, Olmsted County; this man subscribed to Power and Thornton's "Civic and Congressional Township Map of Minnesota," published in that period. These notes may all relate to the same practitioner.

John N. Wheat (1818-1903) was the second physician to settle in Austin. He arrived in the city in September, 1856, five months after Dr. Orlenzer Allen had begun practice there. Dr. Wheat, for many years, was a prominent physician and respected citizen of Mower County.

He was born January 16, 1818, at "old" Hadley, Massachusetts. When he was a child, the family moved to St. Albans, Vermont, and later to Cleveland, Ohio, where he attended the public schools. He next spent eight or nine years in Geneva, New York, and returned to Ohio in 1850. It was in this latter period that he became interested in the study of medicine. In 1852, he was graduated from the Homeopathic Medical College of Cleveland. In an early account, it was stated that the professors on the staff had belonged formerly to the "old school" before turning to homeopathic practice, and that consequently their students had the benefit of instruction in both systems of practice. During the course, John N. Wheat specialized in anatomy and surgery, and was elected by his class as a demonstrator in anatomy.

Dr. Wheat practiced in Oberlin, Ohio, until 1856, when he came to Austin, where, with the exception of a few short absences, he spent the remainder of his life. Like most other physicians of the period, he used the newspapers to announce his qualifications to the public. In 1859, having been away from Austin for a time, he published the following card in a local newspaper:

> J. N. WHEAT, M.D. Would respectfully announce to the citizens of Austin and vicinity that he has, after strong solicitation from friends, consented to locate again in Austin where he may be found at all times in readiness to attend to all professional business entrusted to his care. Particular attention paid to OPERATIVE SURGERY and Surgical Diseases, diseases of Women and Children, also especial attention to that most awful of all diseases—cancer. Persons wishing to examine specimens of the lip and breast which have been removed can do so by calling at my place of residence, at the house of Rev. S. Cook, on Water Street, Austin.
>
> J. N. WHEAT, M.D.

In the history of Mower County published in 1884 it was written about Dr. Wheat: "He is a man organized by nature for his profession. . . . He seems to thoroughly understand the human system in all of its fine, complex and intricate parts—in short a real specialist at any and all branches of the medical science. As a practical surgeon there are few who can cope with his skill, as his success in this direction will be attested to by the scores of amputations he has made in Mower County during the past quarter of a century."

Under the Medical Practice Act of Minnesota, Dr. Wheat received state license No. 736 (H) on December 31, 1883.

Dr. Wheat was married twice. His first wife was Matilda Jane Dewitt, whom he married at Geneva, New York, in 1841. She died in Oberlin, Ohio, in 1850. The only child of the marriage was Amelia Jane (1842-1863). His second wife was Julia A. Cook, a daughter of The Rev. Stephen Cook, the first, or at least, an early clergyman in Austin. There were three children of this marriage of whom, in 1884, one was living: Carrie M. Wheat (Bascomb) who was born on December 6, 1856, the first girl child born in Austin. She was married February 13, 1878, to Edwin G. Bascomb, of Rochester, a brother of Dr. Marshall T. Bascomb, who in the late seventies practiced medicine in Brownsdale and in Grand Meadow.

In April, 1882, Dr. and Mrs. Wheat moved to Rochester, where the doctor practiced until March, 1883 when they returned to Austin. A statement sometimes seen, that Dr. Wheat "spent a few years in Fillmore County where he was elected state senator" is erroneous. The reference was to Dr. James Madison Wheat (1825-1910) of Lenora, Fillmore County, from 1856 into 1887.

Dr. John N. Wheat died in Austin July 23, 1903.

It has been suggested that **John I. Wheeler** was a physician in Mower County, but corroborative evidence is lacking. Dr. S. P. Thornhill, about 1870, bought from John I. Wheeler a farm in sections 5 and 6 of Austin Township when Mr. Wheeler was moving into Freeborn County.

Obadiah Wheelock, eclectic physician and surgeon, and a farmer, came with his wife and children to Mower County in 1872 and settled on a farm in the northeast quarter of section 35, Windom Township, near Rose Creek.

Obadiah Wheelock was born in New Haven, Oswego County, New York July 20, 1828. When he was two years old the family moved to Oneida County, New York. He attended district school and, for three and one-half terms, Whitestone Academy. After teaching school, both before he went to the academy and afterward, he began the study of medicine under Dr. J. M. Comings of New York City. His training included attending clinics at Bellevue Hospital and lectures at the Metropolitan Medical College, from which he was graduated in 1862. He first practiced at Port Leyden, Lewis County, New York, where he remained several years.

When Dr. Wheelock came to his farm near Rose Creek, he had owned the land some fourteen years, but it had not been much improved. His first undertaking was to build a house, set out trees, and cultivate the soil, practicing medicine at the same time. He was still in practice in the late eighties, and perhaps later. His name does not appear in the official directory of 1883-1890 of Minnesota physicians.

Obadiah Wheelock was married in 1856 to Celesta S. Seymour, who was born in December, 1827, at Turin, Lewis County, New York. There were six children of the marriage: Robin S., Henry L., Emerson W., Alva S., Charles E., and Phillip. Little information about the family has been available; Alva S. Wheelock spent much of his life in or near Rose Creek.

— **Wilder** came to Grand Meadow in the autumn of 1876, the second practitioner to settle in that village. He was associated with Dr. Samuel M. Jenks, the first physician in Grand Meadow, both in practice and in the drugstore that Dr. Jenks operated. Dr. Wilder, who "was not a regular graduate in his profession," came to Mower County from Wisconsin. In 1878 he removed to Iowa City, Iowa.

Sarah Catherine Wilcox was graduated from the Hahnemann Medical College of Chicago in 1876. She practiced in Austin, Mower County, from 1886 into 1891. Her Minnesota state license, No. 1373 (H), was issued April 26, 1887. In 1892 she left Austin to practice in St. Paul, and in 1896, having married, she removed to Seattle, Washington.

John P. Williams, a graduate of the Chicago Medical College in 1876, in that year spent a few months in Austin. He formerly had practiced in Winona. In the official Minnesota medical directory for 1883-1890 Dr. Williams was listed as in Le Sueur, Le Sueur County. His license to practice in the state was No. 764 (R), dated June 2, 1884.

John C. Wysor practiced medicine in Brownsdale from 1878 until 1880, when he returned to his old home in Virginia.

President's Letter

IN APPRECIATION

A year replete with events pertinent to the progress of our profession will soon be history. We have witnessed scientific progress in our medical journals and are continuing to implement the best results by applying them to our daily practice of medicine. The economic aspects have been of great concern and have served to unite us in our efforts to promote legislation which will insure the highest quality of medical care to all the people of our nation.

Visiting various states as your representative was a stimulating experience. I was impressed by the active interest in their scientific programs and the earnest participation of the various Houses of Delegates in their common problems; particularly in the field of voluntary health insurance plans.

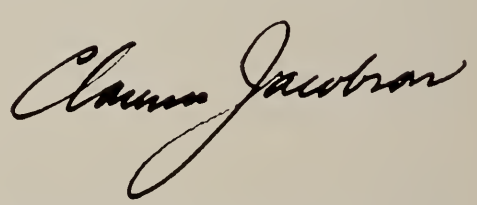
In this area, Blue Shield and Blue Cross continue to be the bulwark. Implementation of these plans has not been without problems in some instances. Active participation by the physicians by virtue of having a voice in the selection of members of the corporate structure of Blue Shield appeared to be a source of strength, so necessary in future negotiations.

The past year has given me, as your president, the privilege of representing you on numerous occasions. May I state that the people of our state hold you and our organization in high regard. This image is the result of the splendid work of our local societies. You, as individual doctors of medicine, are to be commended on your continued endeavors to promote good relations with the public by meeting the needs of your patients with a high standard of medical care.

Differences of opinion as to what constitutes the best in medical care and how the demand can be met will call for the ultimate in sound compromise and solution. Our Association has demonstrated its wisdom by placing emphasis upon that which unites us rather than upon what may separate us. Much remains to be done among ourselves as well as with allied agencies and professions to meet the challenges of the future.

My gratitude to the members of the Association for the privilege of representing them, and to the Executive Secretary, Mr. Harold Brunn, and his splendid staff for their cooperation and assistance. All have contributed to make this a truly satisfying year for me.

My best wishes to all for a Joyous Holiday Season!



President, Minnesota State Medical Association

Editorials

John F. Briggs, M.D.
Arthur H. Wells, M.D.

THE SAFE CAR

For over ten years, we have been experimenting with ways to prevent injury to persons in a collision, and much of that time the public has suffered through television showings and newspaper accounts of the tests. People say, "There's that man again!" and quickly turn off their sets.

Ideas or inventions are usually viewed as notions or fads, and are expected by everyone to quit bothering after a short time and pass on. But if these ideas or notions depend upon the public for support, they must overcome the prejudice of originality; to do this, they must appear in a form which will assure understanding: In this discussion the idea of the "safe car" is presented, in the hope that the idea will persist, whatever theatricals the tests may appear to employ, and refinements will follow from these engineering tests.

Everyone is familiar with the problem of transporting eggs. They are now packaged in cardboard or pressed paper holders, with widely separated compartments and with supporting areas touching each egg. However, if the cardboard carton is dropped flat on the floor, the eggs will break; but if the pressed paper holder is dropped in the same manner on the floor, most likely none will break. Thus two things are evident: first, the eggs must be held in place with a large properly constructed contact area; and second, the impact to which they are subjected must be absorbed rather than rebounded. This is what we are trying to do with people in automobiles. These two things, careful holding and proper absorbing, are necessary in order to keep people *safe*.

There is a tremendous incentive to package people in cars this way. According to Cornell University Crash Injury Research reports, more than one-half of the deaths and injuries in automobiles occur at a speed less than 40 miles per hour. This one-half would approximate 18,000 deaths, nearly 60,000 totally incapacitated, and about 1.4 million injured. These numbers are as big as they appear from the newspaper accounts each day. Actually, the human suffering and loss of life resulting from automobile accidents follows cancer and heart disease in extent, and the U. S. Public Health Service has declared automotive casualties to have reached epidemic proportions. Therefore, if people could be protected from injury for speeds up to 40 miles per hour, the lessening of injury and death would reduce the problem by approximately one-half. This result can be accomplished by the proper design of cars, if they are made to absorb the energy of collision up to 40 miles per hour without causing injury to people wearing seat belts.

The accomplishments have been made possible by the use of hydraulic energy-absorbing bumpers in front of the car, which reduce the force of impact below that which has been found by Colonel John Paul Stapp to be safe with seat belts. The actual forces of crash into a rigid barricade, such as a bridge abutment or a concrete wall, or a head-on collision, are within the tolerances which can be survived without injury at 40 miles per hour. For higher speed crashes, the packaging which prevails greatly aids in reducing the extent of injuries. Even seat belts alone are very effective in reducing injury at lower speeds and for roll-overs.

The tests we have been making on cars have been to determine the most effective and economical means of utilizing these findings. We have observed, for instance, that a 17-inch stroke of the hydraulic bumper is adequately effective for absorbing the crash energy. This length of bumper cylinders can be hid under the car in front of the frame without changing the length of present-day cars, or modifying the styling that now prevails.

We have been particularly interested in finding ways of mounting the seat belts to make their support more effective, and to make their use most convenient and comfortable. We are working to measure the body motions on a seat belt, and have advocated a retractable steering wheel and a re-

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Presented at Methodist Hospital, St. Louis Park (Minneapolis), Minnesota, in the Symposium on Automobile Trauma, November 14, 1959.

The author, Professor James J. Ryan, is Principal Investigator for the Automotive Safety Research Project, University of Minnesota.

cessed dash. Other engineering considerations are being studied, such as a dash-pot damper under the seat and a take-up reel on the belts. It may not be unreasonable to find that the steering wheel, in reality, is a safety surface for a person swinging forward on a seat belt, and it may be advocated that cars have dual steering.

We are trying to understand better that which we already know. The principles of the deceleration of the vehicle and the retardation of the people in the car are well understood, but the application by automobile manufacturers has not received engineering consideration. The word "safety" in car production and selling has taken on questionable status. The public will pay very little more for safety, and the car manufacturers know exactly how little that "little" is. However, the public expects to be protected, and has set up safeguards such as the CAA in aviation, the Pure Food and Drug laws, and other controls to alleviate unreasonable conditions. The Federal Government is the only agency powerful enough to regulate safety into the construction of automobiles, and when the situation becomes sufficiently severe, steps will be taken to correct the deficiency. We hope *you* will participate in this clamor, and that *we* shall know how to build the safer cars.

Mr. Alfred Lowell Mosely, an extremely able psychologist at Harvard University, who is now chief investigator in research of fatal highly collisions (in the Boston area), has described briefly the allied work in this field in a letter to Dr. James L. Morrill, former president of the University of Minnesota, two paragraphs of which follow:

"Professor Ryan's work fits importantly into the larger picture of highway accident research. Professors Severy and Matthewson at the University of California in Los Angeles are doing experimental collisions to learn something of what happens to structures and components of the vehicle, and what collision impacts mean to (simulated) occupants. John Moore and staff at Cornell are making important statistical studies of engineering structures which cause injury to occupants, and the nature and extent of the injuries observed. Professor McDermott at Cornell Medical College is studying the management of the injured traveler from the time of injury to the time of discharge from a hospital. Professor Evans of the University of Michigan and Professor Lissner of Wayne University are studying the thresholds of injury to skeletal structures and organs of the human body, using advanced experimental techniques. Professor Baker at Northwestern is making detailed qualitative studies on non-fatal accidents. At Harvard, my colleague, Dr. Richard Ford, and I are doing detailed clinical studies on the fatal collisions.

"The automobile industry maintains a distance from most of these studies, and quietly undermines both the chief investigators and their efforts. The medical profession extends every courtesy to the researchers and gives freely of knowledge and clinical skill. The legal profession maintains close contact with the results of the studies in the interest of justice. The U. S. Government assists in money, materials, counsel, and moral support to these various studies.

"In the U. S. House of Representatives, the Roberts' subcommittee stays well informed on the status of the several studies with the plan of substituting legislative procedures where voluntary cooperation fails."

The first order of business in the Senate of the Congress convening in January, 1960, had to do with highway safety. A film, "Automotive Crash Tests with Dummies and People," of our experiments toward injury prevention in crash and their results, was prepared by the Audio-Visual Department of the University of Minnesota for presentation to these interested bodies. It is hoped that steps will be taken to require proper energy absorbers and restraining devices in the manufacture of cars for the future. By this means, all manufacturers will compete on the same basis and safety will have engineering status. After about ten years, all cars will have this safety construction, and, since action is equal to reaction, the old cars would have equivalent benefit in the event of a collision with a new car.

It may be concluded, from an engineering standpoint, that the safe construction of cars is a modern necessity, and the time is coming closer when it will be a reality. It is another focal point of attention in a rapidly changing world.

James J. Ryan, M.M.E.

AMBULATORY MANAGEMENT OF ESSENTIAL HYPERTENSION

During the past decade, the availability of potent antihypertensive agents plus an improved understanding of pathophysiologic mechanisms has enabled the physician to control diastolic hypertension in the majority of instances. In recent years the need for surgical management and rigid dietary control has gradually lessened. On the other hand, the need for a comprehensive working knowledge of pharmacodynamic actions, electrolyte alterations and methods of drug titration has increased correspondingly.

The hypotensive effect of dietary salt restriction has been adequately confirmed; however,

there are few patients who will adhere to these diets for any prolonged interval. Fortunately the recent availability of potent oral natriuretic agents has lessened the requirement for severe dietary salt reduction. In fact, the daily administration of thiazide diuretics allows the hypertensive subject to ingest 3 to 5 grams of salt per day without aggravation of the hypertensive process. There does not appear to be any current advantage for the rice diet, as recommended by Kempner.

Weight reduction in the obese patient and the administration of sedatives or tranquilizers to the emotionally labile subject are generally recommended. Likewise abstinence from smoking is considered beneficial. However, although these general measures may produce a minor antihypertensive effect, they are only minimally effective in patients with severe diastolic blood pressure elevation.

Among the wide variety of potent antihypertensive agents currently available, the most useful compounds are the thiazide derivatives, Rauwolfia alkaloids, hydralizine (Apresoline), guanethidine (Ismelin), and the ganglioplegic drugs. The usefulness of the Veratrum compounds is limited by the high incidence of associated side reactions, especially nausea and vomiting. Likewise the development of tolerance limits the clinical application of the oral adrenergic blocking compounds.

The various thiazide derivatives possess similar antihypertensive abilities; and when equivalent natriuretic dosages are administered, equivalent hypotensive responses are obtained. The administration of daily dosages greater than 1000 mg. of cholorothiazide (Diuril, or its equivalent) does not produce an additional antihypertensive effect. On the contrary, larger dosages may cause severe untoward electrolyte effects, particularly hypokalemia. Hyperuricemia may also appear secondary to decreased uric acid clearance. When clinical gout occurs, discontinuation of the drug and/or colcichine administration will adequately terminate the attack.

Recent investigative studies indicate that the antihypertensive effectiveness of the Rauwolfia alkaloids is due primarily to its peripheral effect on the postganglionic sympathetic fibers. The Rauwolfia compounds cause an exaggerated release of norepinephrine from the peripheral nerve endings, and the subsequent catecholamine depletion reduces the arteriolar response to sympathetic stimulation. The central actions of these drugs are probably responsible for only minor antihypertensive effects.

Guanethidine and the ganglioplegic drugs are equally potent hypotensive agents; however, the lesser incidence of side reactions, lack of parasympatholytic effects, and prolonged therapeutic response constitute significant therapeutic advantages for the newer agent.

Despite the availability of numerous effective agents, the search continues for more potent antihypertensive compounds. The employment of various enzyme inhibitors is currently under investigation. It has been demonstrated that the monoamine oxidase inhibitors, including iproniazid and nialamide, possess significant orthostatic hypotensive effectiveness when administered in large dosages. Although the precise mode of action remains uncertain, the activity of the MAO inhibitors appears due (at least in part) to ganglionic blockade. The decarboxylase inhibitors likewise show potential clinical usefulness. Decarboxylase inhibition depresses the biosynthesis of norepinephrine, and a consequent hypotensive effect ensues.

The need for sympathetectomy and/or adrenalectomy has been drastically reduced during recent years. At present, the overwhelming majority of hypertensive subjects can be adequately controlled by medical means. Those patients who fail to respond are candidates for surgical therapy; however, less than 5 per cent of hypertensive subjects fall into the latter category.

Within the past year, an extensive statistical analysis of blood pressure levels and subsequent clinical course in young hypertensives has been reported. The data obtained offers a revealing analysis of the natural history of hypertension and indicates an unequivocal increase in morbidity and mortality rates in these subjects. Perhaps most important of all was the finding that patients with mild diastolic pressure elevation (90-100 mm. Hg.) had a significantly increased incidence of cardiovascular complications, as compared with their normotensive counterparts. These findings coupled with increasing evidences that vascular deterioration can be halted or reduced by effective antihypertensive treatment confirms the need for a dynamic approach to the management of the hypertensive subject.

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Medical Economics

Edited by the
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AMA PRESIDENT REFUTES CRITICS AT SAINT PAUL LUNCHEON

Dr. E. Vincent Askey, Los Angeles, President of the American Medical Association, told a meeting of the St. Paul Area Chamber of Commerce at the St. Paul Hotel on October 26, 1960, that one of the most frequently heard criticisms is that the AMA restricts the number of medical students.

"Our Association does not regulate the number of students admitted to medical schools. It does not decide whether new schools are to be built; it does not decide whether schools are to be expanded," Dr. Askey said.

"Our concern at the moment is that there are not enough medical students being trained for a great profession and that there are not enough talented applicants to medical schools.

"The American Medical Association wants to increase the number of doctors, not limit it," he said.

Refutes "Against Everything" Myth

He also took issue with another popular myth by pointing out that "the American Medical Association is not a negative, 'against everything' organization."

He cited the AMA record concerning legislation in the last Congress. "Our Association testified or submitted statements on forty occasions concerning twenty-five bills," he said. "In twenty-six instances our position was favorable to the legislation under consideration, and eight times we offered our views in an informational manner, expressing our opinion on broad, general subjects rather than on specific proposals.

"Only six times were we opposed to proposed legislation or provisions in a bill," he said.

Dr. Askey added that on the most important issue, "medical care for the aged—we supported a broad proposal of federal-state matching funds to provide care for the needy and near-needy aged without a compulsory system of taxes and coverage-for-all under Social Security."

Dr. Askey noted that "the American Medical Association is desperately concerned about all our elderly citizens, especially their health, their medical needs and their happiness.

"This concern has been twisted and distorted badly by some. To listen to them you get the impression that the AMA and physicians are encouraging the death and suffering of thousands and that we favor a minimum of medical care or none at all, for the elderly.

"I assure you, and all Americans in the older age group, that never were more physicians more sincerely dedicated to the promotion of good health among the elderly and more concerned about delivering the best medical care and services to all these persons," said Dr. Askey.

Need for Mills-Kerr Bill Stated

"Naturally, we in the medical profession were delighted that the House and Senate favored the Mills-Kerr proposal, which we supported, over the compulsory-type measures. We were gratified that the President signed it into law.

"We know that there are older people in this country whose need is great, whose need is immediate. That is why we supported wholeheartedly the Mills-Kerr bill.

"We want the new law to help those on Old Age Assistance, and the undetermined number of people who, while able to pay the other costs of living, find it difficult to withstand the additional burden of the cost of illness.

"These are the people who need help. These are the people who must be helped through the Mills-Kerr bill.

"In the process of helping them, we are preserving voluntaryism . . . we are following the traditional federal-state organizational structure of our nation's government . . . we are maintaining local autonomy . . . we are practicing true economy and avoiding fiscal irresponsibility . . . and we are preserving the right of self-reliant individuals to finance their own health care, as they are doing now and doing satisfactorily," said Dr. Askey.

"It should be clear to any objective person that

government's responsibility is to help those who need help, and that the government's responsibility goes no further.

"When the government does for its citizens the things that they have *the capacity to do for themselves,* our free nation shall be in serious trouble," he emphasized.

Opponents Want Mills-Kerr Bill Failure

Doctor Askey warned that "at the moment, however, there seems to be a conspiracy to prevent the new joint federal-state medical care program for the aged from going into effect around the nation. Those favoring the Social Security approach would have states believe that the development of the Mills-Kerr bill at the state level is too difficult and too confused. Their object obviously is to keep as many states as possible from adopting legislation implementing the new legislation passed by Congress and signed into law by President Eisenhower."

He urged that "as backers of this voluntary, federal-state matching grant program, all of us must do everything possible to see that all states participate." He pointed out to the luncheon guests that several states already have joined the program. In adopting regulations for eligibility and benefits, these first states apparently were neither confused nor slowed by so-called difficulties or ambiguities in the new law.

"I want to assure you that we in the American Medical Association shall do everything possible to encourage states to participate."

Doctor Askey noted that recently the AMA has issued a joint statement with the American Hospital Association urging the early adoption of implementation legislation in every state.

"Having gained this Mills-Kerr victory, we must not become apathetic and forget the follow-up or leave the details to others. We must do what we can to see that all the needy and near-needy aged receive the medical help they have coming under the new law."

HEALTH INSURANCE POLICYHOLDERS IN MINNESOTA REACH NEW HIGH

The number of persons in Minnesota with health insurance reached a new high of 2,681,000 at the end of 1959 reports the Health Insurance Institute.

The report was based on the 14th Annual Health Insurance Council survey of health insurance coverage in the United States, which revealed that nearly 128 million Americans, or 72 per cent of the total civilian population, were protected by health insurance as of December 31, 1959.

The survey of reports from insurance companies, Blue Cross-Blue Shield and other health care plans, disclosed that the number of persons in the state with hospital expense insurance increased by 38,000 during the year to reach a total of 2,681,-000 at the end of 1959.

The number of persons with surgical expense insurance climbed from 2,455,000 at the end of 1958 to 2,525,000 at the end of last year. Persons protected by regular medical expense insurance, which helps pay for doctor visits for non-surgical care, increased from 1,769,000 to 1,881,000.

DOCTORS ASKED TO PRESCRIBE CHEAPER DRUGS TO WELFARE PATIENTS

Physicians in Philadelphia have been asked by William B. Tollen, Commissioner of Public Assistance in the Pennsylvania State Department of Public Welfare, to prescribe less expensive drugs for patients receiving public assistance.

His request came in a letter published in *Philadelphia Medicine,* the journal of the Philadelphia County Medical Society. Tollen asked his readers to become "cost conscious" when prescribing drugs under those programs.

"We recognize that your primary concern as a practitioner," he said, "is to see that the patient receives adequate care. As a member of the community and a taxpayer, however, you are undoubtedly also concerned with the economical use of public funds."

Tollen said expenditures for drugs are running out of proportion for all other items of medical care. He said total expenditures for medical care in 1949 were $4.7 million. Ten years later, he said, they were $8.7 million. Expenditures for drugs in 1949 totaled $1.5 million, or 32 per cent of the total. In 1959, drug expenditures were $4.7 million, or 54 per cent of the total.

"This is a matter of deep concern to the department," Tollen said, "particularly at a time when an impending deficit in our appropriation creates an urgent need to conserve funds. Frankly, we are appealing to you to become 'cost conscious' when you prescribe under our program. We are asking that you exercise careful consideration and professional discretion in choosing medication."

INTEREST IN "COST OF DRUGS" INSURANCE GROWS

Health insurance coverage against the costs of drugs has been steadily expanding, but the eventual role which insurance or prepayment might play in this field is not yet resolved, according to J. F. Follmann, Jr., Director of Information and Research, Health Insurance Association of America.

In an 88-page study dealing with "Drugs, Their Cost, and Health Insurance," Mr. Follmann reported:

"Today there is an increasing degree of insurance of prepayment for the costs of drugs. As voluntary health insurance mechanisms developed protection against the costs of hospitalization some twenty-five to thirty years ago, the costs of drugs prescribed in the hospital were automatically included in the coverage. At that time, however, there was little coverage available for out-of-hospital drugs.

Ten-Year Growth in Medical Expense Insurance Cited

"With the development of major medical expense insurance by the insurance companies about a decade ago and the development of extended benefit coverages by the Blue Cross-Blue Shield plans, an increasing amount of health insurance has become available against the costs of out-of-hospital prescription of drugs."

He said the extent of protection against the costs of prescription drugs was not known, but noted that more than 22,000,000 Americans now have major medical coverage.

Mr. Follmann stated:

"The combined circumstances of improved effectiveness of drugs, increased utilization of drugs, rising cost of drugs, and a willingness on the part of the consumer to spend an increased portion of income, has resulted in increased personal and family expenditures for drugs, both directly and through health insurance and prepayment plans.

Drugs Important Factor in Medical Care Cost

"This can produce a situation of consequence to health insurers and to the purchasers of health insurance, since drugs can become an increasing factor in the costs of medical care and hence in the premium for protection against these costs.

"This, in turn, points to the need for health insurers to give specific consideration to the inclusion of drug costs in their coverages to the extent necessary to and desired by the public, and in such form as to produce the most efficacious results . . ."

The HIAA official said there was growing recognition in the insurance business of the need for more definitive data and knowledge with respect to the financing of drug costs. More experience by insurers, both in breadth and depth, is needed to help determine the role which insurance or prepayment should play in offering protection against such costs, he indicated.

Doctors Play Key Role

Noting that doctors play the key role in the use of drugs, and consequently in the cost of drug coverages, Mr. Follmann emphasized that the most efficient and effective use of funds allocated for drug and other health cost insurance would require "the full and active cooperation of the providers of care . . ."

He also called for "the education of pharmacists" on the nature of insurance coverage and the purpose of health insurance.

COURT SAYS MEDICAL SOCIETY CAN DENY MEMBERSHIP TO A PHYSICIAN

The courts have refused to compel a county medical society to accept a physician as a member. On August 29, 1960, a Superior Court Judge in Phoenix, Arizona, ruled that the courts cannot compel the Maricopa County Medical Society in Phoenix to accept a doctor as a member. The judge said that the medical society is a private corporation and membership in the society may not be acquired as a matter of right and may be denied arbitrarily.

SURVEY SHOWS FREQUENCY OF PUBLIC'S VISITS TO DOCTORS

During the two-year period ending June 30, 1959, Americans averaged ten visits to physicians (the figure was based on the rate of 851.6 million visits per year).

The findings of a survey conducted between July 1957 and June 1959 in an estimated 73,000 households covering 235,000 individuals showed that two out of three took place in the doctor's office, 20 per cent were divided fairly equally between home and hospital clinic outpatient visits, and most of the remainder were in nature of "telephone visits." Urban dwellers used doctors more often than did their country cousins, women more than men, whites more than non-whites.

The Art of Medicine

PR

Carl H. Woyke, B.A.
Editor

NEED FOR MORE DOCTORS

Physicians, medical societies and counsellors in high schools and colleges must step up their recruitment of students for medical schools to assure an adequate, future supply of doctors.

This suggestion was made at a session on doctor supply at the AMA's 1960 PR Institute, devoted to this topic. Other suggestions included:

1. *Medical practitioners* now are not recruiting students for medicine. Individually, they must seek out talented young men and women and sell them on the opportunities in medicine. They must overcome the erroneous belief among students that it is impossible to get a seat in a medical school. They also must inform students that there are tremendous intellectual challenges in medicine and that there are new ways to help students finance their costly medical training.

2. *Medical societies* are promoting recruitment programs, but new projects should be developed. In addition to encouraging their own members to recruit students, medical societies can establish loan funds for needy medical students. And they can work for the removal of state restrictions on medical students from other states.

3. *Counsellors* should be urged to promote a "pre-pre-med" course in high school. The creation of student interest will do much to ease the shortage of talented students for medicine.

Mr. William Just of the Chicago Public Schools urged the medical societies to contact all counsellors in their area, to provide medical career teams to visit high schools, to invite graduating seniors to medical school and hospital open houses, and to emphasize to students the technical aspects of medicine.

He also said that in Chicago the high schools are launching an accelerated program for talented students and that this project may yield a sizable crop of candidates for medical schools.

Attempts to Limit Physician Supplies Denied

Dean Richard Young, M.D., of Northwestern University School of Medicine and Secretary of the Association of American Medical Colleges, emphasized that neither the AAMC nor the AMA has ever sought to limit the output of physicians. In fact, these organizations feel that the most important responsibility and program facing medical education is the recruitment and selection of medical students.

In six years, he said, the number of applicants has dropped from almost 25,000 in 1954 for the 7,000 seats available to 15,000 in 1960 for 8,500 places. Not only is the quantity down, but also the quality, he said.

He called for elimination of the myth about "not getting into medical school," urged the building of student interest in medicine in high school, and stressed the need of more fellowships for medical students to ease their financial burden.

Physician Recruitment Is Important Public Relations Project

C. Lincoln Williston, Executive Secretary of the Texas Medical Association, said that recruitment and doctor supply and distribution is one of the most important public relations projects of medical societies.

He said that medical societies must provide leadership in getting more medical schools, more students, a good supply of physicians for the future, the best possible distribution of physicians and the financial assistance to needy medical students. All of these projects, he emphasized, will bring large public relations dividends to the local society and to its members, in addition to meeting the specific problems.

Dean John Z. Bowers, M.D., of the University of Wisconsin Medical School, asked for the best communications among medical schools, the medical profession and student counsellors. Unless there is good co-operation, he warned, the problems will get worse and federal control of medical education may be possible.

Mr. Leo E. Brown explained that current AMA recruitment efforts include the sending of medical career kits to 8,000 student counsellors in the nation.

"I AM A DOCTOR"

This AMA film is a dramatic and inspiring survey of the variety of careers now available to every qualified student—in general practice, specialization, research, teaching, and administration. But "I Am A Doctor" is much more—it is a moving, true story of a young physician, who, shortly before his death from leukemia, reflected on the great satisfactions—and sacrifices—which medicine had brought to his life.

Through various camera devices, his thoughts and words are visualized on the screen—the long years of college and medical study, the miracles in surgical amphitheatres, the challenges and frustrations of laboratory research, the joys of bringing hope and recovery to the ill, and the molding of young minds and intellects in the classroom.

The young doctor then projects his thoughts into the future, envisioning the promise of tomorrow—space medicine, applying the atom to medical advances, and the new break-throughs in the conquest of disease.

The total impact of this motion picture leaves little doubt that anyone would be proud to say: "I Am A Doctor."

This 25 mm colored film, especially recommended for guidance programs, careers days, school assemblies and health fairs, is available on a free loan-on-request basis (return shipping charges only) from the AMA Film Library, 535 North Dearborn Street, Chicago 10, Illinois.

MINNESOTA MEDICAL CAREERS RECRUITMENT ACTIVITIES LISTED

In Minnesota, more than 11,000 packets of medical careers materials have been distributed to public and private high school libraries, high school counsellors, and public libraries. The project was coordinated by the Minnesota Commission for Patient Care. The Minnesota State Medical Association is a member of that group. Members of the Woman's Auxiliary were responsible for the distribution of these medical careers packets throughout the state of Minnesota. Included in the packet was the AMA booklet, "Medicine As A Career."

A number of county medical auxiliaries have extended their activities to include periodic visits to libraries and careers counsellors to replenish supplies of medical careers recruitment materials.

AMA MEDICAL CAREERS KITS AVAILABLE

The American Medical Association and the Association of American Medical Colleges have prepared a kit of medical careers programs for high schools, colleges and communities.

This kit is for your use, and the materials—handbooks, pamphlets, exhibits and motion pictures—are available to you without charge. A similar kit has already been sent to all state and county medical societies and their executive secretaries and officers will be happy to cooperate in every possible way by providing speakers, programs and whatever assistance you may require in developing school, college and community programs. Kit materials are available from the State Office.

This kit has also been sent to all medical school deans, state vocational guidance directors, and to all members of the American College Personnel Association, the American School Counsellor Association, and the National Vocational Guidance Association. However, there are undoubtedly a great number of schools in which this program has not yet been introduced, and we would appreciate your using these medical career informational aids whenever possible.

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Minnesota Blue Shield

During the first nine months of 1960, Minnesota Blue Shield payments for medical, surgical and obstetrical services of subscribers totaled $7,249,065.39.

This represented 346,229 different services by doctors during the nine-month period.

Of the total payments, $4,851,424.28 were for Plan A contract subscribers, $1,336,678.13 for Plan B subscribers, and $1,061,124.68 for special contracts.

The payments for the first nine months of 1960 were somewhat lower than payments made during the comparable period of 1959, which totaled $7,605,350.45. However, the 1959 figure represented only 290,077 doctor services, compared with the 346,229 services in the 1960 period.

The average fee per service in the 1960 period was $20.93, compared with the average fee during the same months in 1959 of $26.22.

Noteworthy in the report was the high number of diagnostic benefits paid for, including 50,507 diagnostic X-rays and 72,579 diagnostic laboratory services, during the first nine months of 1960.

In addition, there were 8,355 therapeutic X-rays administered and 50 isotope treatments.

In a break-down of other services covered by Blue Shield payments during the first nine months of 1959, there were:

Surgical care of bones, joints and tendons, 17,233 cases; suture of wounds, 9,759; other skin surgery, 40,717; ear, nose and throat surgery, 3,853; tonsillectomies, 5,005; appendectomies, 1,600; neuro-surgery, 2,317; cardiovascular surgery, 1,393; ophthalmology, 3,531; thyroidectomies, 386; thoracic surgery, 369; breast, 1,252; gastro-intestinal, 1,076; herniotomies, 2,093; biliary tract, 1,474; proctology, 2,291; urology, 2,407; gynecology, 8,983; and endoscopic procedures, 6,849.

During the same period, there were 17,174 cases of obstetrical care.

* * *

As a service to the medical profession, Minnesota Blue Shield is naturally dedicated to the principle that the best medicine is preventive medicine.

In keeping with this philosophy, Minnesota Blue Shield in October, 1959, introduced benefits for diagnostic X-ray and laboratory services, when performed in the doctor's office, the patient's home, or the out-patient department of a hospital.

These benefits represent an important contribution to preventive medicine, since they encourage patients to seek earlier diagnosis.

Blue Shield experience during the first year of this new program indicates that subscribers are making extensive use of this coverage. During the first nine months of 1960, 50,507 diagnostic X-rays and 72,579 diagnostic laboratory services were provided under this program.

Dr. Richard R. Cranmer, executive director of Minnesota Blue Shield, noted, "The diagnostic benefits of Blue Shield coverage can have far-reaching effects for the public health of this state, since early diagnosis can often help prevent more serious conditions from developing."

He added, "It is hoped that many more subscribers, during the months ahead, will take advantage of these benefits to help them stay well and help them stay out of the hospital."

Patients, of course, need to be educated to make use of this medical care feature. Doctors should do all they can to impress upon their patients the importance of this Blue Shield benefit and urge them to make full use of it.

This task of public education is required because, far too often, today's patient regards his hospitalization coverage as the means whereby he can receive such diagnostic services. Often, the patient will postpone seeing his doctor until hospitalization may be required merely because he believes only his hospitalization coverage will protect him for such services.

This overemphasis on hospitalization coverage is seen in the fact that many persons use the term "hospitalization" to mean health-care insurance in general, as if it were the all-embracing term which includes hospital care as one of the ancillary services of the doctor of medicine.

That medical care is underemphasized is illustrated by the fact that a high percentage of those who carry hospitalization coverage of some kind do not carry medical-care coverage.

A more proper perspective toward health-care can be gained through education with the stress placed on preventive medicine.

Medical Education

MEDICAL PROGRESS MAKES CAREER OF PHYSICIAN MORE ATTRACTIVE

Medicine today offers more opportunities and rewards than ever before but there are signs that many young persons are failing to take advantage of them, noted a special report released by the AMA.

While the number of students entering the profession is increasing, the number applying for admission to the nation's eighty-five medical colleges is decreasing.

Since 1956, the number of applicants has dropped steadily from 15,917 to 14,951. In 1947, nearly 7 per cent of all college graduates made applications for medical schools. In 1958, only 4 per cent applied.

The Minnesota Picture

Dr. Robert B. Howard, Dean of the University of Minnesota Medical School, reporting to the 1960 House of Delegates, presented the following facts about medical education in Minnesota.

"In Minnesota—after a low point of 282 applicants for our then 125 places—we have now come up a little, and our picture is looking a little better. Last year, for example, we had 337 applicants for an increased number of places, 140 places, and our ratio is 2.4 applicants for every place. Our situation is like that of other state supported medical schools. State supported schools, in general, have much smaller numbers of applicants than the private schools, because the state schools do have to take into account geographic factors in making their selections. I mentioned the fact that we have gone to 140 students. We are planning, contingent upon adequate financial support as provided by the next Legislature, to go to 150 students to be admitted. This even in the face of the situation I have outlined with regard to applicants."

Some of the reasons behind the figures are known. The low birth rates of the '30s undoubtedly are partly responsible for the decrease in applicants in recent years. Multiplying opportunities in other fields also are believed to be diverting possible medical candidates.

The AMA article comments that those who pass up medicine today are doing so at a time when it has become one of the most rapidly progressing fields in the nation offering maximum promise for a young man or woman.

Medical Research Grows

The rate of progress is reflected in the huge growth of medical research. In 1940, medical research amounted to $45,000,000. This year it will reach roughly $600,000,000 and predictions for 1970 go as high as $3,000,000,000.

Obviously, a greater number of researchers are needed now than before and will be needed in ever increasing numbers in the future. The expansion is sure to continue because each discovery inevitably opens up new avenues of investigation.

Space Age Medicine Offers New Challenge

Some opportunities created in medicine by recent developments, such as the dawn of the space age, are well known. But there are equally as many opportunities in other areas of medicine not so well known.

For example, medical scientists have become increasingly aware of the fact that the total health of a person depends on the health of each individual cell of his body. This has led to an intensified study of the chemical and physical nature of the cell calling for researchers whose primary interest is chemistry and physics. It may be the work of the biochemist and bio-physicist on the cell that holds the key to heart disease, cancer and mental illness.

Every branch of science plays a role in medicine. Mathematics, for one, has important applications. On the surface, biology appears to be a disorderly process. But if living organisms follow the pattern found elsewhere in nature, there must be laws governing their behavior. The unique challenge of medicine to the mathematician is to find these laws that will bring order out of disorder.

Medicine offers a never-ending challenge to the inquiring mind. Although many diseases have been conquered, many more remain unsolved. Despite the rapid accumulation of knowledge, there is so much left to be learned that this is probably only the first act of the show.

At the same time medical progress is opening up new opportunities for young physicians, the population explosion and rising standard of living,

are increasing opportunities by increasing the demand for medical service.

More Medical Specialists Needed

There is a greater need for physicians in every one of the profession's 50 specialities and subspecialties. Regardless of the area he chooses, the young M.D. can be assured of filling a real need and performing a valuable service.

Average Student Could Study Medicine

Some prospective candidates for medical school may not apply in the belief that medicine is too difficult a field for them. Actually, the study of medicine is within the grasp of the average student. Few college students who make a serious effort could not graduate from medical school.

Before anyone decides medicine is too difficult for him, he should remember that physicians are made, not born. They are human beings like other human beings, and the esteem they eventually earn results from training and experience.

A typical group of medical students represents a variety of talents and interests. Most are "B" students with a well-rounded background in the sciences and humanities.

The chances of being admitted to medical school were never brighter. Educational facilities are being continuously improved and expanded. Nine new medical schools have been created since the end of World War II.

Consequently, more applicants can be accepted and the number of students enrolled has shown a steady increase. This in turn has produced more graduate M.D.s in the postwar period.

Curriculums Are Streamlined

Also encouraging are the efforts now under way to shorten the total span of formal education in medicine. These include the move to combine college and medical school into a single program leading to the M.D. in six or seven years. Doctor Howard told delegates that curriculum changes are also underway in Minnesota.

Financial Need of Medical Student Told

At the same session of the Minnesota State Medical Association House of Delegates, Doctor Howard commented on the need for loan funds for medical students.

"We do have need for loans. First, I want to say something about the short term loan program. A year ago your society very generously authorized a short term loan program. You provided $2,000 for the Medical School, and operated this through the Minnesota Medical Foundation, for the purpose of helping the student who acutely needs money. He's got to pay his tuition, or he's got to pay the rent. He's got to buy groceries, or he needs money for a couple of weeks until his ship comes in, or maybe for a month until he can float a more permanent type of loan. We knew there was such a need."

Doctor Howard pointed out that the $2,000 loan fund set up by the Minnesota State Medical Association was turned over one and one-half times during the first eight months of its existence.

"This has been a very active loan fund, and very useful—and there have been no defaults. The maximum amount of time for this loan is three months, and there is no interest. After this, the student has to get a more permanent type of loan.

"Now our students have need for longer term loans—and maybe we should include the faculty in on this too, I don't know. But the students have need for longer term loans. We have a University program of loans operated through the University's Bureau of Loans and Scholarships. These funds are used, and used quite extensively. However, they have very definite limitations, and these limitations do work hardships on medical students. They have a maximum annual borrowing allowance of $750 and a total of $1500. In other words, all that a medical student can borrow during his entire four years from the University's Bureau of Loans and Scholarships is a total of $1500. And we do have some very serious needs for additional funds, funds which could be made available to students over and beyond these limited funds."

New Loan Fund Established

A new permanent loan fund for medical students at the University of Minnesota was established by the House of Delegates. On recommendation of the Council, approximately $13,000 was appropriated by the delegates for this fund and it will be available at low interest rates for students who have exhausted all of the loan possibilities made available to them through other sources and who might otherwise be obliged to abandon their careers in medicine.

At the same time, final details were agreed upon for an emergency loan fund to be called the "Herman M. Johnson Emergency Student Loan Fund" which will be used for short term loans to tide medical students over financial crises. It will be available in amounts up to $200 without interest for periods of ninety days. A total of $4,000 has been appropriated for this fund of which $3,100 is a transfer of the Herman M. Johnson Fund held by the Association for many years. It

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is to be used for an appropriate memorial to the late Dr. Herman M. Johnson of Dawson. Doctor Johnson was a University Medical School graduate, a former president of the Association and first chairman of the Committee on Public Health Education.

Move to Establish New Medical School in Minnesota

A resolution passed by the House of Delegates approved the establishment of a new medical school in Minnesota. The resolution further stated that the Minnesota State Medical Association cooperate with a well-organized effort to establish a new medical school in Minnesota.

Saint Paul Seen as Location for New Medical School

The Northern Association for Medical Education was organized by seventy-one physicians in the fall of 1958. This group saw the impending shortage of physicians that faced the nation in the next twenty years and felt the imperative need to take action.

The announcement of their intentions brought in other members until the organization grew, within a few months, to more than 248 doctors.

During the first year NAME developed its program through committees: to incorporate as a nonprofit organization; to establish relations with educational institutions; to formulate the definition of its objectives in terms of a medical school; to create interest from civic and governmental bodies, and to document the reasons why Saint Paul was a logical place to build a new school of medicine.

In 1960, NAME set up offices and retained an experienced administrator in the field of medical education. NAME is now in the development period, striving to work out a detailed program.

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In Memoriam

ARTHUR J. HENDERSON

Dr. Arthur J. Henderson, Ramsey County coroner, died October 21, 1960, in St. John's Hospital in St. Paul.

Doctor Henderson, sixty-six years of age, was appointed coroner in 1955 on the retirement of Dr. Carl Ingerson. He was a deputy coroner for a decade before that. He was re-elected to a four-year term in 1958.

Doctor Henderson introduced two innovations as coroner: a fingerprint bureau in 1957 and a short "coroner's school" for suburban police in September of this year.

He was born in Lake Mills, Iowa, where he received his preliminary education. He attended St. Olaf College in Northfield, Minnesota, where he received his Bachelor of Arts Degree in 1915. His medical degree was obtained from the University of Illinois College of Medicine in 1919.

Doctor Henderson practiced medicine in Kiester, Minnesota, from 1920 to 1944 and then moved to St. Paul in 1945. He was a public health officer and public school physician in North St. Paul, where he also maintained a private practice.

He was a member of the Masonic Lodge, Ramsey County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

Survivors include his wife, Hazel; a daughter, Mrs. Wayne Hurd, Dallas, Texas; two sons, Arthur A., U. S. National Parks Service, Asheville, N. C., and Lowell A., St. Paul, and two grandchildren.

Another son, Edwin, a pilot with Capital Airlines, died in a plane crash in 1958.

DANIEL F. PENNIE

Dr. Daniel F. Pennie, retired Duluth physician, died October 3, 1960, in a Duluth Hospital. He was seventy-nine years of age at the time of his death.

Doctor Pennie was born in Villard, Minnesota, and received his preliminary education at Alexandria, Minnesota. He attended Carleton College in Northfield, Minnesota, from which he received a Bachelor of Science degree in 1909. He taught high school in Stillwater for a year before entering the University of Minnesota Medical School. He received his medical degree from that school in 1914.

After practicing medicine in the state of Washington and in Northfield, Minnesota, he moved to Duluth in 1916 and was associated there with the late Dr. Robert Graham.

During the forest fire of 1917, he headed the medical staff of the Home Guards. After resigning from that post, he headed the medical department at the Butler Shipyards in Superior. He retired from active practice in 1955.

Doctor Pennie was a member of the Ionic Lodge, AF & AM; Scottish Rite Bodies, Aad-Temple of the Shrine, St. Louis County Medical Society and American Medical Association. He was granted life membership in the Minnesota State Medical Association in 1955.

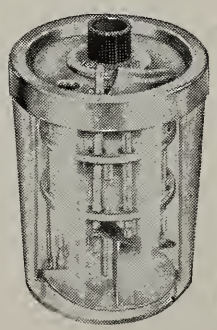
Surviving are his wife, Florence; a daughter, Mrs. Bernard Ostendorf, Stanford, Connecticut; two sons, Donald, Minneapolis, and Robert, Duluth; two sisters, Mrs. E. Garrett Clarke and Mrs. Robert Ballentine, Villard, and eight grandchildren.

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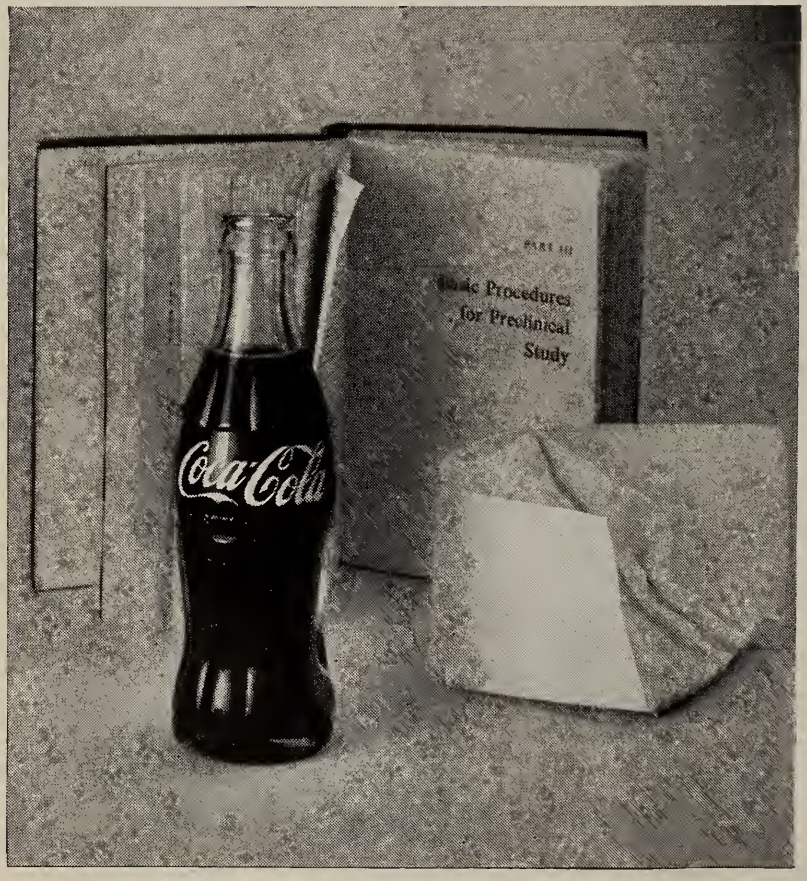
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[1] *Jorres, S. M.: Unpublished test report from Pratt Diagnostic Clinic, New England Medical Center, Boston, Mass. (July, 1958)*

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Communications

NEW ANTI-MALARIA PILL DEVELOPED UNDER ARMY RESEARCH CONTRACT

A new anti-malaria pill which promises to be the most effective anti-malarial drug combination developed so far, soon will be given to U. S. troops in Korea, the Department of the Army announced.

Resulting from Army supported studies conducted by Dr. Alf S. Alving of the University of Chicago, the new tablet combines two drugs used separately in the past for malaria prevention—chloroquine and primaquine, both developed since World War II. Dr. Alving's investigations have been conducted under contract with the Army Medical Research and Development Command, Washington, D. C.

Since 1951, chloroquine and primaquine have complemented each other in malaria treatment although they have not previously been taken together in tablet form. New treatment procedure for military personnel in malarious areas will be the administration of one of the new tablets each week.

Korea is one area where malaria is prevalent and the drug will be used there first. Because it is so easy to administer, the new pill is a great improvement over earlier treatment methods. Standard treatment in recent years has been a weekly dose of chloroquine to suppress typical malaria symptoms—recurring chills and fever—caused by malaria parasites in the blood cells of people bitten by malaria bearing mosquitoes. Upon leaving the malarious area, military personnel took primaquine for fourteen consecutive days. This drug kills malaria parasites which otherwise could dwell for years in the liver and other tissues, causing later relapses of the disease.

Chloroquine, an excellent suppressant but no cure for the disease, is relatively easy to administer. Military personnel have used it in malarious areas since the start of the Korean War in doses of one tablet a week without unpleasant side effects. It has replaced World War II's atabrine and the traditional quinine, both of which had to be taken daily to suppress malaria symptoms. Both tended to produce nausea, headache and other unpleasant effects.

In 1951, primaquine, an actual cure for malaria, was ready for use. It was found it could be used effectively without bad side effects when administered in controlled doses. This treatment usually was accomplished under close supervision of medical officers on ships returning troops from overseas. Because of today's shortened travel time, personnel returning to the United States by fast ship and by aircraft will benefit from elimination of the fourteen-day treatment period.

The new pill has as yet been given no name.

DEPARTMENT OF THE ARMY
Office of the Surgeon General
Technical Liaison Division
Washington 25, D. C.

This Section is for you to voice your convictions, comments, and queries on all subjects political, economic, historic, humorous, scientific or otherwise, to many physicians. Writings not sufficiently formal and too brief for an editorial or a scientific manuscript are requested. Clinical and research observations, no matter how brief, similar to those in *The Lancet* (London), are particularly encouraged.

The Physician's Diary

New officers of the Northern Minnesota Medical Association for the ensuing year are **L. J. Opsahl, M.D.**, Willmar, President; **Ray A. Johnson, M.D.**, Fergus Falls, Vice President; and **Josiah Fuller, M.D.**, Duluth, Secretary-Treasurer. The 1961 annual meeting will be held in Willmar, Minnesota.

* * *

At the recent meeting of the American College of Surgeons, **Walter A. Fansler, M.D.**, Emeritus Professor of Surgery, University of Minnesota, was elected to the Board of Governors of the American College of Surgeons.

* * *

The opening of a physician's office in Savage has been assured with the announcement that **Dr. Eugene Kuz**, Shakopee, will begin practice there. Dr. Kuz has been associated with **Dr. Bror Pearson** in Shakopee since July. He received his degree in medicine from National University of Ireland in Dublin.

* * *

Three Mayo Clinic staff members attended the 22nd annual meeting of the American Academy of Neurological Surgery in Boston and participated in the program. **Dr. George S. Baker** presided at the meeting as president and delivered the presidential address on "The Generations of Neurosurgeons: Past, Present and Future." **Dr. John W. Kirklin** and **Dr. Alfred Uihlein** both presented papers.

* * *

Dr. W. V. Knoll, Brainerd pathologist, addressed the St. Joseph's Hospital professional staff nurses at their monthly meeting. Doctor Knoll lectured on laboratory tests and their role in diagnosis and treatment.

* * *

Mayo Clinic surgeon, **Dr. W. H. ReMine**, received the motion picture award of the American College of Surgeons at the meeting in San Francisco. The award was for the film entitled "Branchial-Cleft Cysts and Sinuses: Their Embryologic Development and Surgical Management," which was presented at the 1959 meeting of that Association.

* * *

Dr. Arthur C. Kerkhof, Minneapolis, addressed the semi-annual meeting of the Minnesota Society of Internal Medicine at St. Luke's Hospital in Duluth. Dr. Kerkhof spoke on rehabilitation for cardiac victims.

* * *

Newly elected officers of the Mayo Foundation Alumni Association include **Dr. L. Raymond Scherer**, Minneapolis, President and **Dr. Howard Andersen**, Rochester, Secretary-Treasurer. The election took place at the Association's 36th annual meeting in Rochester.

Graceville physician and surgeon, **Dr. I. L. Oliver**, suffered a mild stroke while on his annual goose-hunting trip northwest of The Pas in eastern Saskatchewan. **Dr. Daniel J. Moos**, Minneapolis, took care of the surgery calls during Dr. Oliver's absence.

* * *

Dr. Carl E. Johnson, Rochester, and his wife have returned from a one-month tour of the Scandinavian countries. While there, Dr. Johnson visited medical centers in Malmo, Lund, Uppsala and Stockholm, Sweden. His visit to the Karolinska Institute in Stockholm was of particular interest.

* * *

Sun City, Arizona, is the new home of **Dr. J. J. Heimark**, former Fairmont physician and surgeon, and his wife. Doctor and Mrs. Heimark left Fairmont during the month of October. Dr. Heimark says that Sun City has a center for physicians, surgeons and dentists which attracted him and spurred his decision to locate there. Sun City is a suburb of Phoenix.

* * *

Dr. F. Henry Ellis, Jr., Mayo Clinic, has been appointed assistant editor of the Lewis-Walters "Practice of Surgery" which is published in twelve volumes by W. F. Prior Company, Inc. **Dr. Waltman Walters**, also of the Mayo Clinic, is editor-in-chief of this publication.

* * *

Two new consultants have been appointed to the Mayo Clinic staff. They are **Dr. Deloran L. Thurber**, Rochester, who received his degree in medicine from the University of Minnesota Medical School, and **Dr. James V. Ross, Jr.**, Easton, Pennsylvania. Doctor Ross graduated from Duke University School of Medicine.

* * *

The Wabasha County Medical Society has elected the following new officers: **Dr. L. M. Ekstrand**, Wabasha, President; **Dr. Wm. P. Gjerde**, Lake City, Vice President, and **Dr. D. G. Mahle**, Plainview, Secretary-Treasurer.





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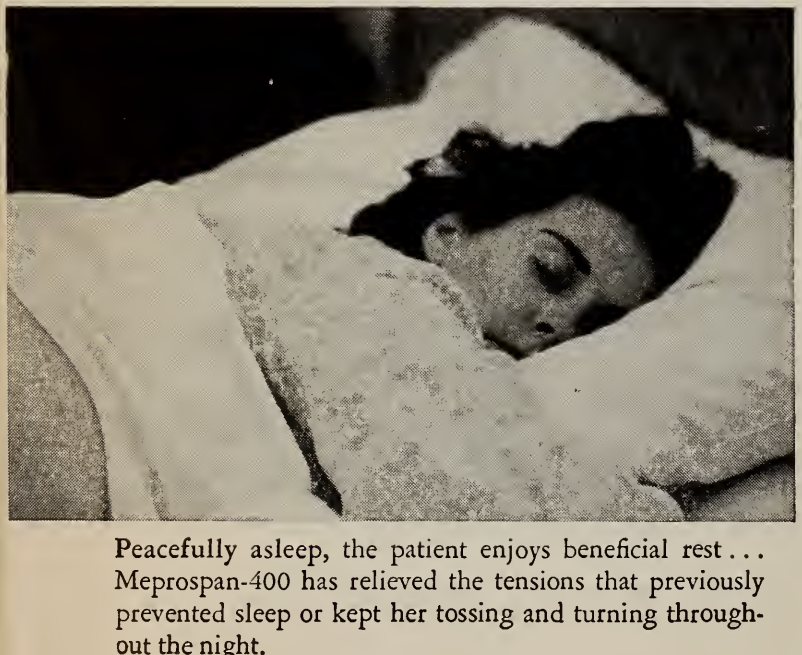
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Five Rochester surgeons participated in panel discussions during the annual clinical meetings of the American College of Surgeons. They were: **Dr. John M. Waugh,** who moderated a panel during a colectomy: **Dr. Deward O. Ferris,** panelist, during the cholecystectomy; **Dr. Wm. H. ReMine,** panelist, gastrectomy; **Dr. Joseph H. Pratt,** panelist, hysterectomy; and **Dr. Edward S. Judd,** moderator, during a radical neck dissection.

* * *

Dr. L. M. Randall, Mayo Clinic emeritus member, was honored at a dinner by the people who worked with him. A travel fund for clinical trips by residents in his section was set up in his honor.

* * *

The Hawley Chamber of Commerce recently sponsored a banquet in honor of **Dr. V. D. Thysell's** twenty-six years of medical practice in Hawley. The banquet was held at the Hawley Lutheran Church. Dr. Thysell has recently opened a practice in the new Moorhead Medical Center.

* * *

The association of **Dr. Duane L. Orn,** formerly of Turtle Lake, Wisconsin, with the Olmsted Medical Group, has been announced. Dr. Orn will be in general practice. He is a graduate of the University of Minnesota Medical School.

* * *

Effective October 15, of this year, **Dr. Olaf Lukk** began a practice of medicine in Prior Lake, Minnesota. He had formerly been a physician and surgeon in Montgomery for over six years.

Dr. Karl Palmer, an associate with the Oliver Clinic in Graceville since August 1959, has resigned his position there and is now located in Menomonie, Wisconsin, where he has joined a group of physicians in the Red Cedar Clinic. At his new location, he is limiting his practice to the field of internal medicine.

* * *

Dr. E. F. Gambill, Rochester physician, has returned from a trip to South America. He presented a paper at the 7th Pan-American Congress of Gastroenterology held at San Diego and Vina Del Mar, Chile. His paper, "Chronic Relapsing Pancreatitis—Fate of Fifty-Six Cases Observed Since 1939-43 Inclusive," was written in collaboration with **Drs. A. H. Baggenstoss** and **J. T. Priestly.**

* * *

Dr. Kenneth W. Teich, Duluth obstetrician and gynecologist, was a participant in the seventh annual meeting of the Academy of Psychosomatic Medicine. He was a member of a panel which discussed psychosomatic aspects of sterility and frigidity at a luncheon. Dr. Teich also served as co-chairman of the convention's press room in his capacity as a member of the Academy's executive committee.

* * *

Mayo Clinic heart surgeon, **Dr. John W. Kirklin,** appeared on the program of the annual scientific meeting of the American Academy of Pediatrics in Chicago. He spoke on "Cardiovascular Emergencies." **Dr. George B. Logan,** also of the Mayo Clinic, conducted a scientific round table discussion on pediatric allergy at the same meeting.

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